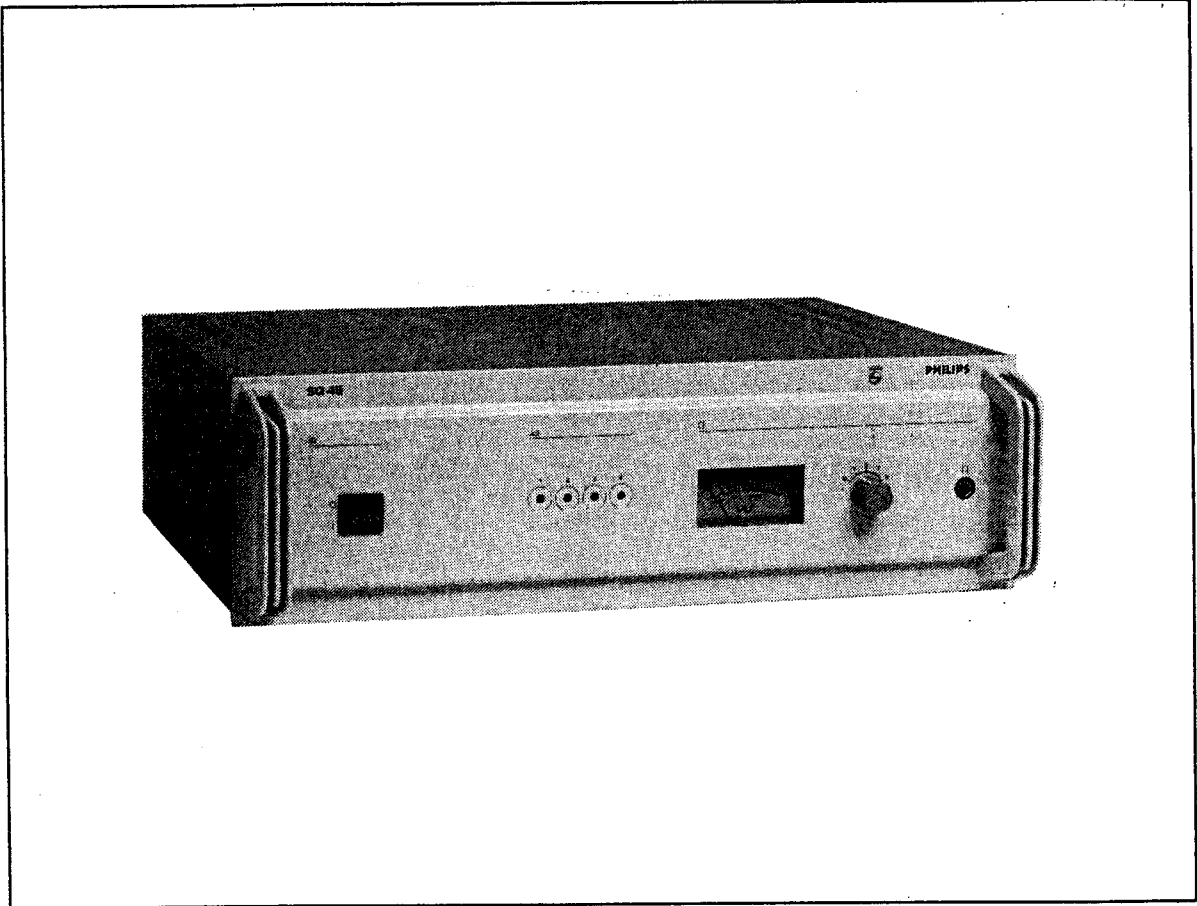


SQ45 Public Address High Performance Power Amplifier



SERVICE MANUAL

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1. INTRODUCTION

1.1. GENERAL

=====

The SQ45 range of high performance audio power amplifiers have been designed for smooth operation in professional Public Address projects. A good reliability, ease of installing, along with good service accessibility have been optimized in their design.

Because of the high level of modular setup and the ease of install and maintain. The aim of this Service Manual is mostly to provide in a First Line Service. At nearly all possible breakdowns or failures interchanging of modules will be the quickest and cheapest repair-method.

1.2. THE TOTAL SQ45 AMPLIFIER RANGE

=====

The mechanical housing for the range of SQ45 amplifiers has been designed to accommodate up to a maximum of four individual amplifiers in a single housing. A number of configurations are available to suit a wide variety of application needs.

The total range of SQ45 Amplifiers can be subdivided into two groups:

- Low output Impedance Amplifier:

- LBB1331/00, /10, /30, /40 : 2 x 80 Watt Amplifier
 - LBB1332/00, /10, /30, /40 : 4 x 80 Watt Amplifier
 - LBB1335/00, /10, /30, /40 : 1 x 320 Watt Amplifier
- Type numbers ending with /00 and /30 are table top versions including top cover.
 - Versions /10 and /40 are 19" housings for rack mounting and excluding top cover.

NOTE: All above described Low Output Impedance Amplifiers ending with /00 and /10 are out of production since 1991.
All above described Low Output Impedance Amplifiers ending with /30 and /40 are out of production since 1993.

- 100 Volt Output Amplifier:

- LBB1342/xx : 1 x 100 Watt amplifier
- LBB1343/xx : 2 x 100 Watt amplifiers
- LBB1344/xx : 1 x 200 Watt amplifier
- LBB1345/xx : 2 x 100 Watt plus 1 x 200 Watt amplifiers
- LBB1346/xx : 4 x 100 Watt amplifiers
- LBB1347/xx : 2 x 200 Watt amplifiers
- LBB1348/xx : 1 x 400 Watt amplifier

- Type numbers ending with /00, /30 are table top versions including top cover.
- Type numbers ending with /10, /40 are 19" housings for rack mounting and excluding top cover.
- Type numbers ending with /20, /50 are D.C. only, 19" rack mounted versions and excluding top cover.

NOTE: All above described type numbers ending with /00, /10, /20, 100V-Output Amplifiers are out of production since 1991.
All above described type numbers ending with, /50, and the LBB 1345/30 & /40, 100V-Output Amplifiers are out of production since 1993.

NOTE: Although typenumbers ending with /60 and /70 have formally existed they were never delivered to the market.
As a consequence all previous information w.r.t /60 and /70 versions can be ignored. Not will we mention these versions in this manual.

Because of a modular setup, the full range of SQ45 amplifiers can be built up with following modules:

- 1 x 100W Amplifier Module
- 1 x 200W Amplifier Module
- 2 x 100W Amplifier Module
- 1 x 200W Slave Amplifier Module
- Monitor Board
- REM-DC,AC Powersupply SQ45
- REM-DC Powersupply SQ45

Depending on the desired amplifier configurations, the following amplifier modules are mounted in the SQ45 amplifier:

- LBB1331/xx: 1 x (2 x 100W) Amplifier module
- LBB1332/xx: 2 x (1 x 100W) Amplifier module
- LBB1335/xx: 2 x (2 x 200W) Amplifier module

- LBB1342/xx: 1 x (1 x 100W) Amplifier module
- LBB1343/xx: 1 x (2 x 100W) Amplifier module
- LBB1344/xx: 1 x (1 x 200W) Amplifier module
- LBB1345/xx: 1 x (2 x 100W) Amplifier module
and 1 x (1 x 200W) Amplifier module
- LBB1346/xx: 2 x (2 x 100W) Amplifier module
- LBB1347/xx: 2 x (1 x 200W) Amplifier module
- LBB1348/xx: 1 x (1 x 200W) Amplifier module
and 1 x (1 x 200W) Slave Amplifier module

NOTE: - For all /00, /10, /20, /30, /40, /50 amplifiers, the before mentioned Amplifier module configuration is used.

- Differences between (/00, /30) and (/10, /40) versions are found in the Ventilator-Module and some mechanical differences, caused by the way of installing.
- Differences between (/00, /30) and (/20, /50) versions are found in the Ventilator-Module, the Power-Supply (only DC-version /20 and /50) and some mechanical differences, caused by the way of installing.

2. TECHNICAL DATA

Technical data : applicable to all amplifiers unless otherwise stated.

Mains supply : 110V, 127V, 220-230V,
240V at 50 - 60Hz

- Inrush current limiter : 30 A

Emergency Battery supply : +48V nominal (polarity protected)

- Inrush current limiter : 1 A

Power Output	Vdc(min.)	Vdc(nom.)	Vdc(max.)	
with Emergency supply	42V	48V	64V	73V
- Power output related to rated				
Output Power at 1kHz	-4dB	-3dB	0dB	+1dB

Power consumption (max.) for -> 4 x 100Watt, 2 x 200Watt,
1 x 400Watt Amplifiers.

Mains supply voltage

- at rated output power-3dB: 1200VA
- at rated output power
-8dB (VU=0) : 500VA (full signal, VU=0)
- no audio signal : 55VA

Battery Supply 48V DC		
- at rated output -3dB	:	10A
- at rated output -8dB	:	5A (VU=0)
- no audio signal	:	0.6A
Switch on delay time	:	≤ 4 seconds
Audio ('music') input		Balanced
Input sensitivity	:	0.5 - 10 Volt (adjustable)
Input impedance	:	10 kOhms.
Priority ('call') input		Balanced
Input sensitivity	:	1 Volt (0.5V using eg.jumper S3)
Input impedance	:	10 kOhms.
Surveillance ('test') input		Balanced
Input sensitivity	:	500 mV (20kHz) for rated output -20dB.
Input impedance	:	10 kOhms at 20kHz
Signal-to-noise ratio	:	> 91dB (typical) >87dB flat
Cross talk attenuation	:	> 70 dB at 5 kHz
Frequency response (-10dB)	:	50 to 20.000 Hz (-3dB)
Distortion (THD)	:	< 0.5% at rated power at 1 kHz.
Interference	:	< -50dB for field of 3 V/m
Power bandwidth (-3dB)	:	50 to 20.000 Hz. (THD = 2%) (-3dB)
Monitor output	:	Headphone impedance 8 - 600 Ohms
VU-meter	:	'O'mark = 40V +/- 0.5 dB at kHz on 100V output
Safety	:	according to IEC 65 and BS 415
Environmental conditions		
Operating temperature	:	-10°C min. to +55°C max.
Storage temperature	:	-40°C to +70°C
Relative humidity	:	<95%
Dimensions (H x W x D)	:	140 x 440 x 360mm (3HE 19"rack height)

This product is manufactured to comply with the radio interference requirements of the Council Directive of 4th November 1987/308/EEC.

Output Data Low Output Impedance Amplifiers per Amplifier Channel

=====

Rated output power:	80W	320W
(per IEC 268 - 3)		

Minimum Load Impedance:	4 Ohm	4 Ohm
-------------------------	-------	-------

Configuration per Type Number:

LBB 1331/xx	2 x	-
LBB 1332/xx	4 x	-
LBB 1335/xx	-	1 x

Output Data 100 Volt Amplifiers per Amplifier Channel

=====

Rated output power:	100W	200W	400W
(per IEC 268 - 3)			

Maximum load capacitance

100 V output	50 nF	100 nF	200 nF
70 V output	100 nF	200 nF	400 nF
50 V output	200 nF	400 nF	800 nF

Minimum Load Impedance:

100 V output	100 Ohm	50 Ohm	25 Ohm
70 V output	50 Ohm	25 Ohm	12.5 Ohm
50 V output	25 Ohm	12.5 Ohm	6 Ohm

Configuration per Type Number:

LBB 1342/xx	1 x	-	-
LBB 1343/xx	2 x	-	-
LBB 1344/xx	-	1 x	-
LBB 1345/xx	2 x	1 x	-
LBB 1346/xx	4 x	-	-
LBB 1347/xx	-	2 x	-
LBB 1348/xx	-	-	1 x

Weight (approx. kg. unpacked)		/00 /30	/10,/40	/20,/50
=====				
- LBB 1331	2 x 80 Watt	11.2	9.7	--
- LBB 1332	4 x 80 Watt	14.8	13.3	--
- LBB 1335	1 x 320 Watt	16.3	14.8	--
- LBB 1342	1 x 100 Watt	13.0	11.5	8.5
- LBB 1343	2 x 100 Watt	14.2	12.7	9.7
- LBB 1344	1 x 200 Watt	13.1	11.6	8.6
- LBB 1345	2 x 100 Watt +	19.7	18.4	12.9
	1 x 200 Watt			
- LBB 1346	4 x 100 Watt	20.8	19.3	14.0
- LBB 1347	2 x 200 Watt	20.1	18.6	13.3
- LBB 1348	1 x 400 Watt	17.9	16.4	11.1

3. FUNCTIONAL DESCRIPTION

3.1. GENERAL

=====

Each individual amplifier module has two balanced audio inputs;

- a 'music' input, with adjustable pre-set level control, for (continuous) background music, and
- a 'priority' input with fixed input level for (occasional) paging and other calls.

The 'music' input is normally active until a call is made, at which time the in-built relay switches the amplifier to the 'priority' input, overriding the music signal and its volume setting. When the call is finished the relay switches the amplifier back to the music input and the music signal resumes at its normal level.

The change over from one input to the other can be controlled remotely.

A test input is provided, into which an inaudible signal of maximum 20KHz may be injected. This signal is sampled at the output to provide continuous monitoring of correct amplifier functioning. Extra equipment must be used to sample the signal (e.g. The Amplifier Surveillance Board from the SM40 range may be used).

The 100V transformer coupled output may be tapped at three different voltages (100V, 70V and 50V). Alignment and monitoring are accomplished via a four position selector switch for monitoring individual amplifiers via the VU-meter and headphones.

The SQ45 unit can be powered with an emergency 48V DC battery supply. An automatic switch-over device switches to the battery supply in the event of a mains failure, or if there is a significant drop in the mains supply.

3.2. CONTROLS

=====

- Mains on/off switch

- Sensitivity control pre-set for Ch. 1
Sensitivity control pre-set for Ch. 2
Sensitivity control pre-set for Ch. 3
Sensitivity control pre-set for Ch. 4

- Output level VU-meter plus illuminated scale (mains on).

- Four position selector switch for monitoring individual amplifier channels via the VU-meter and headphones.

- Headphone socket (6.3 mm standard jack socket).

3.3. LOUDSPEAKERS FOR 100, 70, OR 50 VOLT SYSTEMS

=====

Loudspeakers with suitable matching transformers can be connected in parallel with the 100V, 70V or 50V outputs as long as the total power does not exceed the nominal output power rating of the amplifier. 100V loudspeakers connected to the 100V output will consume their nominal power. If, however, 100V loudspeakers are connected to the 70V output, then the loudspeakers power consumption will be equal to one half of their nominal rated power. This means that twice as many loudspeakers can be connected without overloading the amplifier.

Similarly, if 100V loudspeakers are connected to the 50V output they will only consume a quarter of their nominal power and an increase of up to four times as many loudspeakers is possible.

3.4. IN-PHASE CONNECTION OF LOUDSPEAKERS

=====

Disturbing effects may occur, particularly when loudspeakers are mounted close together, which are caused by the loudspeakers being connected in anti-phase.

To ensure an in-phase connection in 100V systems, all similar loudspeaker terminals (in most cases one terminal is marked with a red dot) must be connected to the same wire on the distribution cable.

3.5. PARALLEL CONNECTION OF AMPLIFIER INPUTS

=====

The pre-amplifier output of, for example, a mixing amplifier, may be connected to the input of this amplifier and to the inputs of several other power amplifiers in parallel. Public Address systems of practically any wattage can be built by using this method of connection.

3.6. CONNECTORS

=====

- 5 pole 180° DIN-type plugs (not supplied)
- 12-pole Mate-N-Lock connectors

On delivery the amplifier is supplied with a small plastic bag containing two 12-pole Mate-N-Lock blocks, complete with contact pin ejector tool. When fitting the contact pins to the external wiring, they may be either soldered or crimped.

4. INSTALLATION INSTRUCTIONS

4.1 GENERAL

=====

The installation work can be divided into three stages:

1. Preparation of the unit itself
2. Preparation of the rack cabling
3. Mounting the unit into the rack

They will be discussed separately

4.2 1. PREPARATION OF THE UNIT

=====

The following can best be completed prior to mounting the unit into the 19"rack:

- Mains supply

- The unit as supplied is suitable for mains voltages of 220 230V A.C. For adaption to mains voltages of 110V, 127V and 240V, the required voltage has to be set accordingly. To change the voltage, unplug the long grey coloured screw connector from its connector block and rewire it for the appropriate voltage. Push the connector block firmly back into its place.
- For mains voltages of 110V and 127V, the 4A mains fuse built into the standard "Europlug" has to be replaced by one of the value of 15A. To remove the mains fuse, first remove the mains power lead from the socket at the rear of the unit. Carefully insert a medium sized screwdriver under the fuse cover's small lip (nearest the socket pins) and gently twist the screwdriver to lever the fuse holder out.
- A self restoring thermal cut-out operates on the primary winding of the mains transformer.

WARNING: When due to excessive temperature, the thermal cut-out shuts down the amplifier, the pilot lamp in the VU meter will not extinguish, the full mains voltage is still present inside the unit.

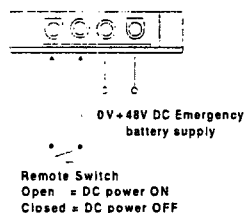
- The unit is supplied with a 1.2m long mains lead, terminated with a standard IEC two pole earthen mains plug. In some countries it will be necessary to replace this plug with one of a local standard type.

A replacement mains plug must be wired as follows:

Earth	-	green/yellow
Neutral	-	blue
Live	-	brown

WARNING: THIS APPARATUS MUST BE EARTHEN

- **48 Volt Emergency Power Supply**
 - In situations where the mains power supply is unreliable an emergency 48V battery supply may be used. This supply will automatically be switched in whenever the mains power fails.
 - A Mate-N-Lock supply socket is provided to allow the 48V DC battery to be connected.



- On the Power Supply Board a fuse for the 48V D.C. supply is mounted. The value should be 10Amp.
- **Sensitivity settings**
 - The 'Call' input sensitivity is optimized for use with the SM30 or SM40 system, therefore set to 1V. The 'music'-input sensitivity is adjustable between 0.5 and 5V to cope with output levels or domestic music sources, e.g. CD player, radio tuner, cassette player, etc.

4.3 2. PREPARATION OF THE CABLING

=====

- Inputs

Each of the amplifiers in the unit is provided with three inputs:

- 'Priority' input,
- 'Music' input and
- 'Test' input.

The connections for these inputs, and the wiring for the remotely controlled selection between 'Priority' and 'Music' input, is made via two, 5-pole 180° DIN-type sockets per amplifier.

The pins of the corresponding plugs are to be connected as described on the following page:

- A) Music input (balanced) -->-->-->-->-->-->--> (unbalanced)
- | | |
|--------------------------------------|-------------|
| pin 1: music signal, live | live |
| pin 2: music signal, screen | screen |
| pin 3: music signal, live (return) | neutral |
| pin 4: not connected | input sel. |
| pin 5: input selection* (* see note) | input sel.* |

*: To allow remote control of input signal selection:

Plug A:

- | | | |
|----------------|---|-------------------------------------|
| Music input | - | pins 2 & 5 linked (relay activated) |
| Priority input | - | pins 2 & 5 open |

- B) Call and Test input (balanced) -->-->-->-->-->--> (unbalanced)
- | | |
|-----------------------------------|---------|
| pin 1: call signal, live | live |
| pin 2: call signal, screen | screen |
| pin 3: call signal, live (return) | neutral |
| pin 4: test signal, live | live |
| pin 5: test signal, live (return) | neutral |

The 'Test' input (pins 4 & 5, plug B) is active under both conditions (music and call).

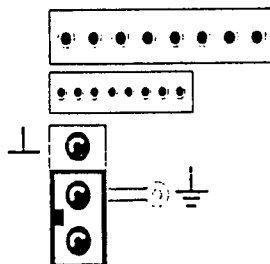
NOTE: The test input is provided for ultimate use with the SM40 microcomputer controlled surveillance system.

- Outputs

- Mate-N-Lock sockets are mounted on the rear panel. These are provided with corresponding plugs and serve primarily as transformer output connections to a variety of loudspeakers. Socket X5 is for outputs of amplifiers 2 and 3. Socket X6 is used for the outputs of amplifiers 1 and 4.

- Earthing

- On delivery the electrical and mechanical earths of the unit are connected.
- To disconnect the electrical and mechanical earths, jumper S1 must be positioned as shown or removed.



- When two or more units are used in a system, it is necessary to ensure that earth loops are not introduced by earth wiring. In this case, the electrical earth of all units should be linked together, then joined by one wire link to the mechanical earth on one unit only.
- A suitable earthen A.C. mains distribution socket should be provided inside the 19" rack to provide power for the amplifiers.

4.4 3. MOUNTING THE UNIT INTO A 19" RACK (/10, /40, /20 and /50 versions only)

=====

WARNING: SQ45 amplifiers for rackmounting are delivered and installed without top covers.
For safety reasons the SQ45 amplifiers may only be installed in fully closed 19" racks.
Any cover or door must be firmly be secured and may only be opened by authorized personnel.

CAUTION: The temperature inside the rack should never exceed +55°C. The lifetime of amplifiers that are operated above this temperature limit will strongly decrease.
For detailed instructions how to meet this requirement refer to the SQ45 User Instructions.

- 1.- SQ45 rack mount versions are standard equipped with rack mount supports. The unit can simply be installed with 4 bolts and washers in any standard 19" rack. No further support is necessary.
- 2.- If more units are mounted they must be separated with 1HE blind panels. This provides for sufficient airflow between stacked amplifiers.
- 3.- If other equipment, eg. source units or equalizers, etc, is installed in the same rack it should be mounted underneath the amplifiers. This prevents the source units from being heated up by the amplifier.
- 4.- After the units are mechanically mounted in the rack they are connected to the audio system.
One 'PRIORITY' and one 'MUSIC' input for each amplifier section and the Mate-N-Lock connectors X5 and X6.
- 5.- Finally the units are connected to the mains supply.

5. INTERCHANGING OF MODULES

5.1. GENERAL

=====

Because of the modular setup of the SQ45 range of System Amplifiers interchanging of modules will be the quickest and cheapest repair method. Some Modules are easy to interchange. For some modules however, explanation about mounting and demounting will be helpful. In the following paragraphs we will explain how to exchange modules in case of system failures.

Mounting of serviced or interchanged modules will be done in reversed order as prescribed below.

5.2. REMOVING AMPLIFIER-MODULES

=====

- First remove the cover of the SQ45 Amplifier by removing 6 screws mounted in the side-panels of the SQ45.
- Remove the two bars across the amplifier-modules by loosening the four screws mounted on the side of the amplifier
- Loosen (do not remove) the screw on the back panel of the amplifier-module
- At the front of the amplifier-module a nut, spring and distance-bush has been mounted on a screw which is positioned through a hole in the heatsink of the amplifier-module. Remove the nut, spring and distance-bush.
- From the module a connection is made to the monitor-module at the front of the SQ45. If the amplifier is a two channel amplifier module (2 x 100W) two wires are connected to the monitor-module. Before unplugging this (or these) wire(s), please note the position of the connector(s), so they will not be interchanged when modules are remounted. Looking at the connectors on the monitor-board and numbering the connectors from one to four from left to right, the cable of amplifier-channel "one" (see backside of SQ45) is connected to connector "one" on the monitor board; cable "two" to connector "two" and so on.
- Unplug connectors at the front of the module
- Remove the Module from the SQ45.

5.3. REMOVING POWER-SUPPLY-MODULE

=====

- First remove the cover of the SQ45 Amplifier by removing 6 screws mounted in the side-panels of the SQ45.
- Remove the two bars across the power-transformer by loosening the four screws mounted on the side of the amplifier
- Remove the two screws at the back panel of the Power-Supply-module.
- Before removing the Power-Supply module the supply-transformer has to be removed:
 - unplug the two connectors from the transformer to the Power-Supply-Module.
 - remove nut and spring in the centre of the transformer
 - remove transformer
 - Unplug connector from mains ON/OFF switch
 - Unplug connector (s) to amplifier modules
 - Unplug connector from monitor-panel
 - Unplug connector to the ventilator
 - Unplug ground connection from back panel of Power Supply-Module to the left side of the housing.
 - On the bottom of the SQ45 two plastic pins are keeping the board of the Power Supply to its place. Gently push the pins inside.
 - Now you are able to take the Power Supply Module out of the SQ45.

5.4. REMOVING MONITORING-PANEL

=====

- First remove the cover of the SQ45 Amplifier by removing 6 screws mounted in the side-panels of the SQ45.
- On front of the SQ45, 4 inbus-screws are mounted. Remove the front of the SQ45 by removing the four inbus-screws.
- The Monitor-Board is kept to its place by two screws mounted at the back of the front and a nut mounted behind the knob for amplifier-monitoring selection.
- Remove the two screws at the backside of the front.
- Remove plastic cap that is inserted in the knob.
- Remove the nut mounted in the knob.
- Remove knob.
- Remove nut which becomes reachable after removing knob.
- Unplug connectors from power-supply and amplifiers from monitoring board.
- Remove monitoring-panel.

6. SPARE PARTS LIST

6.1. GENERAL

=====

In this chapter the spare parts for the complete SQ45 amplifier range are listed. Because of the modular setup we have identified a "COMMON PARTS"- list for all SQ45 versions. The parts which are defined for the different type of modules are listed separately.

Because of the high level of modular setup and the first line service philosophy a limited number of spare parts will fulfil all maintenance and service-requirements.

6.2. SPARE PARTS FOR THE LBB1331, LBB1332, LBB 1335

COMMON SPARE PARTS FOR LBB1331/xx, LBB1332/xx, LBB1335/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	REM-DC/AC-Powersupply Assembly	5322 310 10437
	Monitor Panel Assembly	5322 310 10446
	Output Module Assembly	5322 310 10447
	Fan assembly for /00 & /30 versions	5322 310 10448
	Fan assembly for /10 & /40 versions	5322 310 10451
	Contact Assembly (12p+4p male-socket)	5322 310 10449
	Knob (/00 and /10)	5322 414 30133
	knob (/30 and /40)	5322 414 60769
	Cap for knob (/00 and /10)	5322 414 70042
	Cap for knob (/30 and /40)	5322 462 41842
	ON/OFF mains switch	5322 277 14312
	Handgrip (/00 and /10)	5322 498 50316
	Handgrip (/30 and /40)	5322 498 10466
	Foot	5322 462 50461
	Male socket, 12pins (Ampl.connect.)	5322 265 44111
	Frontpanel (/30 and /40)	5322 447 50149
	Fixing ear 19"rack (/10)	5322 498 50312
	Fixing ear 19"rack (/40)	5322 498 50325
	Housing cover (/30)	5322 447 50152

SPECIFIC SPARE PARTS FOR LBB1331/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power Supply Transformer SQ45 200W	5322 310 10436

SPECIFIC SPARE PARTS FOR LBB1332/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power Supply Transformer SQ45 400W	5322 310 10438

SPECIFIC SPARE PARTS FOR LBB1335/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 X 200W) Amplifier Module	5322 214 91304
	Power Supply Transformer SQ45 400W	5322 310 10438

6.3. SPARE PARTS FOR THE LBB1342, LBB1343, LBB1344, LBB1345, LBB1346,
LBB1347, LBB1348.

COMMON SPARE PARTS FOR LBB1342/xx, LBB 1343/xx, LBB1344/xx,
LBB1345/xx, LBB1346/xx, LBB1347/xx, LBB1348/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	REM-DC, AC-Powersupply Assembly	5322 310 10437
	REM-DC, Powersupply Assembly(/20, /50)	5322 310 10442
	Monitor Panel Assembly	5322 310 10446
	Output Module Assembly	5322 310 10447
	Fan assembly for (/00, /30)	5322 310 10448
	Fan assembly for (/10, /20, /40, /50)	5322 310 10451
	Contact Assembly (12p+4p male-conn.)	5322 310 10449
	Knob (/00, /10, /20)	5322 414 30133
	Knob (/30, /40, /50)	5322 414 60769
	Cap for knob (/00, /10, /20)	5322 414 70042
	Cap for knob (/30, /40, /50)	5322 462 41842
	ON/OFF Switch	5322 277 14312
	Handgrip (/00, /10, /20)	5322 498 50316
	Handgrip (/30, /40, /50)	5322 498 10466
	Foot	5322 462 50461
	Male socket, 12pins (Ampl. connector)	5322 265 44111
	Frontpanel (/30, /40, /50)	5322 447 50149
	Fixing ear 19"rack (/10, /20)	5322 498 50312
	Fixing ear 19"rack (/40, /50)	5322 498 50325
	Housing cover (/30)	5322 447 50152

SPECIFIC SPARE PARTS FOR LBB1342/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 x 100W) Amplifier module	5322 214 91303
	Power supply transformer SQ45 200W	5322 310 10436
	100W output transformer	5322 310 10441

SPECIFIC SPARE PARTS FOR LBB1343/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power supply transformer SQ45 200W	5322 310 10436
	100W output transformer	5322 310 10441

SPECIFIC SPARE PARTS FOR LBB1344/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 X 200W) Amplifier Module	5322 214 91304
	Power Supply Transformer SQ45 200W	5322 310 10436
	200W output transformer	5322 310 10443

SPECIFIC SPARE PARTS FOR LBB1345/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 x 100W) Amplifier Module	5322 214 91305
	(1 x 200W) Amplifier Module	5322 214 91304
	Power Supply Transformer SQ45 400W	5322 310 10438
	100W output transformer	5322 310 10441
	200W output transformer	5322 310 10443

SPECIFIC SPARE PARTS FOR LBB1346/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power Supply Transformer SQ45 400W	5322 310 10438
	100W output transformer	5322 310 10441

SPECIFIC SPARE PARTS FOR LBB1347/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 x 200W) Amplifier Module	5322 214 91304
	Power supply transformer SQ45 400W	5322 310 10438
	200W output transformer	5322 310 10443

SPECIFIC SPARE PARTS FOR LBB1348/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 x 200W) Amplifier Module	5322 214 91304
	(1 x 200W) Slave Amplifier Module	5322 310 10444
	Power Supply Transformer SQ45 400W	5322 310 10438
	400W output transformer	5322 310 10445

6.4 Spare Parts for Power Supply assembly

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
8	Mains inlet (male)	5322 265 24043
35	Fuse, T4A/250V	4822 070 34002
F1	Fuse, 10A/60V	4822 070 61003

6.5 Spare Parts for DC Power Supply assembly

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
F1	Fuse, 10A/60V	4822 070 61003

6.6 Spare Parts for monitor panel assembly

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
S1	Switch SRBM15 ALPS	5322 273 30389
16	VU-meter	5322 344 60177
X7	Phone Jack 6,35 (stereo)	4822 267 30522
R1-R4	Potentiometer (20K, preset)	5322 101 11129

6.7 Spare Parts for (1 x 100W) Amplifier Module

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
14	Metal clip (for eg. TS21)	5322 401 10783
15	Protection Plate (for eg. TS21)	5322 466 61949
eg. BD1	Connector	5322 267 40954
eg. TS14	BDT88 PNP-Transistor	4822 130 62241
eg. TS21	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg. TS21	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg. TS21	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg. TS22	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg. TS22	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg. TS22	BDW84C PNP-Transistor (3th version)	5322 130 63688
R69,R169	Biasing Current Potentiometer	5322 101 10578
eg. R83	Resistor OE47 Ohm	5322 113 31041
F1	Fuse Slow 5 x 20, 5A/250V	4822 070 35002
K1	Relay Takisawa RY-24	5322 280 70236
L1,L101	Coil	5322 157 62582
T1	Transformer	5322 146 30903

6.8 Spare Parts for (1 x 200W) Amplifier Module

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
14	Metal clip (for eg. TS21)	5322 401 10783
15	Protection Plate (for eg. TS21)	5322 466 61949
eg. BD1	Connector	5322 267 40954
eg. TS14	BDT88 PNP-Transistor	4822 130 62241
eg. TS21	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg. TS21	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg. TS21	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg. TS22	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg. TS22	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg. TS22	BDW84C PNP-Transistor (3th version)	5322 130 63688
R69,R169	Biasing Current Potentiometer	5322 101 10578
eg. R83	Resistor OE47 Ohm	5322 113 31041
F1	Fuse Slow 5 x 20, 5A/250V	4822 070 35002
K1	Relay Takisawa RY-24	5322 280 70236
L1,L101	Coil	5322 157 62582
T1	Transformer	5322 146 30903

6.9 Spare Parts for (2 x 100W) Amplifier Module

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
14	Metal clip (for eg. TS21)	5322 401 10783
15	Protection Plate (for eg. TS21)	5322 466 61949
eg. BD1	Connector	5322 267 40954
eg. TS14	BDT88 PNP-Transistor	4822 130 62241
eg. TS21	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg. TS21	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg. TS21	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg. TS22	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg. TS22	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg. TS22	BDW84C PNP-Transistor (3th version)	5322 130 63688
R69,R169	Biasing Current Potentiometer	5322 101 10578
eg. R83	Resistor OE47 Ohm	5322 113 31041
F1,F101	Fuse Slow 5 x 20, 3,15A/250V	4822 070 33152
K1,K101	Relay Takisawa RY-24	5322 280 70236
L1,L101	Coil	5322 157 62582
T1,T101	Transformer	5322 146 30903

6.10 Spare Parts for (1 x 200W) Slave Amplifier Module

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
14	Metal clip (for eg. TS21)	5322 401 10783
15	Protection Plate (for eg. TS21)	5322 466 61949
eg. TS1	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg. TS1	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg. TS1	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg. TS2	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg. TS2	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg. TS2	BDW84C PNP-Transistor (3th version)	5322 130 63688
eg. R83	Resistor OE47 Ohm	5322 113 31041
F1	Fuse Slow 5 x 20, 5A/250V	4822 070 35002
L1,L2	Coil	5322 157 62582

7. DIAGRAMS

Besides the electrical and the mechanical drawings of the setup of the Amplifiers the following drawings of the several modules are included:

- 1 x 100 Watt Amplifier module
- 1 x 200 Watt Master Amplifier module
- 1 x 200 Watt Slave Amplifier module
- 2 x 100 Watt Amplifier module
- Monitor Board
- Rem-DC/AC-Power Supply
- Rem-DC Power Supply

From all these modules the circuit diagram, and the components layout are provided.

8.1 Service Information : 4822 861 05004

8.2 Service Information : 4822 861 05005



PHILIPS

Service Information

Communication & Security Systems

Date : July 4, 1991

Category : Documentation Changes

Article group : SAG 6100

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Additional type-numbers because of different colour

Contents : Additional Philips Consumer Spare-parts

The SQ 45 type-numbers concerned:

LBB 1331/30; LBB 1331/40; LBB 1332/30; LBB 1332/40;
LBB 1335/30; LBB 1335/40; LBB 1342/30; LBB 1342/40;
LBB 1343/30; LBB 1343/40; LBB 1344/30; LBB 1344/40;
LBB 1344/50; LBB 1345/30; LBB 1345/40; LBB 1345/50;
LBB 1346/30; LBB 1346/40; LBB 1346/50; LBB 1347/30;
LBB 1347/40; LBB 1347/50; LBB 1348/30; LBB 1348/40;
LBB 1348/50.

Additional Spare-parts (colour related):

Front-panel	5322 447 50149
Knob	5322 414 60769
Cover for knob	5322 462 41842
Handgrip	5322 498 10466

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4822 861 05004

Service Information



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Service Information

Communications & Security Systems

Industrial Electronics

Date : July 4, 1991
Category : Documentation Changes
Article group : SAG 6100
Product : SQ 45 Amplifiers
Service Manual : 4822 733 24397
Reason : SOAR - protection - improvement
Contents : Description of changes

The SOAR - protection is the power-amplifier-output-transistor-protection. The recognition of a few applications initiated an improved protection of the output-stage of the 100W- and 200W - modules:

1 x 100W - module 5322 310 10527:
1 x 200W - module 5322 310 10439:

	<u>old</u>	<u>new</u>
C44 and C45:	47nF	100nF
R71 and R74:	22k Ω	68k Ω
R102 and R103:	2,2 Ω	1 Ω
D23 and D24 (zener):	33 V	13 V

2 x 100W - module 5322 310 10435:

	<u>old</u>	<u>new</u>
C44, C45, C144 and C145:	47nF	100nF
R71, R74, R171 and R174:	22k Ω	68k Ω
R87, R88, R187 and R188:	10 Ω	0 Ω
D23, D24, D123 and D124 (zener):	33 V	13 V

4822 861 05005

Service Information

The 'upgraded' module 1 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number: Serial-number:

LBB 1342/00	664
LBB 1342/10	709
LBB 1342/20	601
LBB 1342/30	601
LBB 1342/40	638
LBB 1342/50	601

The 'upgraded' module 1 x 200W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number: Serial-number:

LBB 1335/00	601
LBB 1335/10	601
LBB 1335/30	601
LBB 1335/40	603
LBB 1344/00	748
LBB 1344/10	1260
LBB 1344/20	601
LBB 1344/30	601
LBB 1344/40	636
LBB 1344/50	601
LBB 1345/00	601
LBB 1345/10	601
LBB 1345/20	601
LBB 1345/30	601

Type-number: Serial-number:

LBB 1345/40	606
LBB 1345/50	601
LBB 1347/00	601
LBB 1347/10	1081
LBB 1347/20	601
LBB 1347/30	601
LBB 1347/40	646
LBB 1347/50	601
LBB 1348/00	792
LBB 1348/10	1666
LBB 1348/20	601
LBB 1348/30	601
LBB 1348/40	812
LBB 1348/50	601

The 'upgraded' module 2 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

<u>Type-number:</u>	<u>Serial-number:</u>	<u>Type-number:</u>	<u>Serial-number:</u>
LBB 1331/00	601	LBB 1343/50	601
LBB 1331/10	601	LBB 1345/00	601
LBB 1331/30	603	LBB 1345/10	601
LBB 1331/40	601	LBB 1345/20	601
LBB 1332/00	601	LBB 1345/30	601
LBB 1332/10	601	LBB 1345/40	606
LBB 1332/30	603	LBB 1345/50	601
LBB 1332/40	602	LBB 1346/00	601
LBB 1343/00	601	LBB 1346/10	1054
LBB 1343/10	825	LBB 1346/20	601
LBB 1343/20	601	LBB 1346/30	601
LBB 1343/30	601	LBB 1346/40	621
LBB 1343/40	611	LBB 1346/50	601

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Service Information

Communication & Security Systems

Industrial Electronics

Date : 23 July 1992
Category : Documentation Changes
Article group : SAG 6100
Product : SQ 45 Amplifiers
Service Manual : 4822 733 24397
Reason : Improvements
Contents : See list

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4822 861 05023

Service Information

1 SOAR PROTECTION

The possibility occurs that the power-amplifier-output-transistors become defective when:

- The output is short circuited, (not a normal situation) and, a too high input signal (+10dBV) is inputted, (not a normal situation), and power switched on.

For this reason the SOAR - protection has been changed. Experience to date has indicated an improved protection of the output-stage of the 100W- and 200W - modules:

NOTE: For modifying the amplifier modules see also Service Information 4822 861 05005 (SOAR protection improvement) date july 4 1991 !!

1 x 100W - module 5322 310 10527:

1 x 200W - module 5322 310 10439:

		<u>old</u>	<u>new</u>
C37 and C38	:	68uF/10V	22uF/50V
C42 and C43	:	220uF/25V	47uF/63V
C46	:	2.2uF/63V	4.7uF/63V
R32	:	8K2	6K8
R56	:	10E	22E
R89	:	-----	680E
R101	:	22E	47E
1X200W TS21, TS23, TS25, TS27	:	BDV65B TS	BDV67B TS
1X200W TS22, TS24, TS26, TS28	:	BDV64B TS	BDV66B TS
1X100W TS21, TS25	:	BDV65B TS	BDV67B TS
1X100W TS22, TS26	:	BDV64B TS	BDV66B TS

2 x 100W - module 5322 310 10435 :

		<u>old</u>	<u>new</u>
C37, C38, C137 and C138	:	68uF/10V	22uF/50V
C42, C43, C142 and C143	:	220uF/25V	47uF/63V
C46, C146	:	2.2uF/63V	10uF/63V
R32, R132	:	8K2	6K8
R64, R164	:	47E	68E
R89, R189	:	-----	680E
TS21, TS23, TS121, TS123	:	BDV65B TS	BDV67B TS
TS22, TS24, TS122, TS124	:	BDV64B TS	BDV66B TS

NOTE: The above mentioned power transistors are implemented at the factory from the serial numbers described on the following pages (right side), or when not a serial number described on the right hand side, the serial

numbers continuing on the left side. All other modifications are implemented from the serial numbers on the left hand side onwards !

The ' upgraded ' module 1 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number: Serial-number:

LBB 1342/00	664	
LBB 1342/10	718	
LBB 1342/20	601	
LBB 1342/30	640	643
LBB 1342/40	831	872
LBB 1342/50	601	

The 'upgraded' module 1 x 200W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number: Serial-number:

LBB 1335/00	606
LBB 1335/10	601
LBB 1335/30	604
LBB 1335/40	612
LBB 1344/00	748
LBB 1344/10	1314
LBB 1344/20	601
LBB 1344/30	671
LBB 1344/40	1238
LBB 1344/50	601
LBB 1345/00	602
LBB 1345/10	603
LBB 1345/20	601
LBB 1345/30	604

Type-number: Serial-number:

LBB 1345/40	650	664
LBB 1345/50	601	
LBB 1347/00	601	
LBB 1347/10	1105	
LBB 1347/20	601	
LBB 1347/30	626	634
LBB 1347/40	1107	1229
LBB 1347/50	601	
LBB 1348/00	792	
LBB 1348/10	1825	
LBB 1348/20	601	
LBB 1348/30	667	700
LBB 1348/40	2305	2690
LBB 1348/50	601	

The 'upgraded' module 2 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

<u>Type-number:</u>	<u>Serial-number:</u>	<u>Type-number:</u>	<u>Serial-number:</u>
LBB 1331/00	601	LBB 1343/50	601
LBB 1331/10	602	LBB 1345/00	601
LBB 1331/30	605	LBB 1345/10	601
LBB 1331/40	610	LBB 1345/20	601
LBB 1332/00	601	LBB 1345/30	601
LBB 1332/10	602	LBB 1345/40	606
LBB 1332/30	604	LBB 1345/50	601
LBB 1332/40	606	LBB 1346/00	601
LBB 1343/00	601	LBB 1346/10	1054
LBB 1343/10	861	LBB 1346/20	601
LBB 1343/20	601	LBB 1346/30	609 615
LBB 1343/30	612 630	LBB 1346/40	929 1060
LBB 1343/40	822 860	LBB 1346/50	620

2 QUIESCENT CURRENT ADJUSTMENT

To reduce the thermal runaway between the amplifier module and slave module, it is necessarily to adjust the quiescent-current, this must be done only at the 1x200W amplifier module, (when the amplifier is COLD !!!)

Adjust R69 slowly to the right until the voltage between point X5-1 and X5-3 reaches 10 ± 1.5 mV.

This modification has been done at the factory from all above mentioned serial numbers onwards (left side).

3 VU METER

Diode D3 (BZX 79-C8V2) on the monitor PCB must be changed into BZX 79-C6V2. The reason is to increase the life of the VU meter lamp. For diagrams see page 66 and 67 of the manual.

4 RELAY CIRCUIT

To make the relay-circuit at the 1 x 100W, 2 x 100W and 1 x 200W module insusceptibility to interference, four resistors must be changed into another value. R9 and R109 must be changed

into 100K, R10 and R110 must be changed into 10K.

This modification is already done at the factory from all serial numbers onwards on the left hand side of the serial numbers mentioned at chapter 1.

5 ADDITIONAL SPARE-PARTS

POWER TRANSISTOR (BDV 66B)	5322 130 42514
POWER TRANSISTOR (BDV 67B)	5322 130 61572
DIODE (D3) BZX 79-C6V2	4822 130 34167
HANDGRIP	5322 498 10466

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4822 861 05023

Service Information

8. GENERAL SERVICE INFORMATION

8.1	4822 861 05004	SQ45, New colour
8.2	4822 861 05005	SQ45, Soar Protection Improvement
8.3	4822 861 05023	SQ45, Soar Protection Improvement
8.4	4822 861 05032	SQ45, Wrong code numbers
8.5	4822 861 05034	SQ45, New, amplifier modules + /60 & /70 types
8.6	4822 861 05045	SQ45, Modification of modules

8.4 Service Information : 4822 861 05032



PHILIPS

Service Information

Communication & Security Systems

Industrial Electronics

Date : 17 December 1992
Category : Documentation Changes
Article group : SAG 6100
Product : SQ 45 Amplifiers
Service Manual : 4822 733 24397
Reason : Wrong Service Code-numbers
Contents : Description / New code numbers

The power transistors BDV66B and BDV67B Service code-numbers, had been wrongly indicated within the Service-Information 4822 861 05023.

Please change this items within your manual, in order to prevent mistakes:

<u>Item:</u>	<u>New Service code-number:</u>
BDV 66B	5322 130 63267
BDV 67B	5322 130 63268

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8.5 Service Information : 4822 861 05034



PHILIPS

Service Information

Communication & Security Systems

Date : 1 November 1993

Category : Documentation Changes

Article group : SAG 6100
Customer Support
Supply Centre -- Breda

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Introduction of new amplifier modules.
Introduction of new type numbers (/60, /70).

Contents : See contents list (page 2)

4822 861 05034

Service Information

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1 DESCRIPTION OF PRODUCT CHANGES

1.1 Increased reliability

Problems with SQ 45 amplifiers can occur when more of these amplifiers are mounted in 19 " racks and a permanent 20 kHz surveillance mode is applied and/or a too high capacitive load is connected to the output of the amplifier.

This causes an additional power dissipation in the amplifier modules and consequently a temperature increase that effects the reliability of the amplifier.

By selecting some other capacitors that can withstand higher temperatures the required reliability can be achieved again under these extreme circumstances.

In addition, by changing the PTC underneath the cooling fin on the amplifier module, the amplifier fan switches on at 60°C i.s.o. at 75°C.

1.2 New typenumbers

The following new type numbers have been added:

	<u>TABLE-TOP</u>	<u>RACK MOUNT (19")</u>
1x 100 W	LBB 1342/60	LBB 1342/70
2x 100 W	LBB 1343/60	LBB 1343/70
1x 200 W	LBB 1344/60	LBB 1344/70
4x 100 W	LBB 1346/60	LBB 1346/70
2x 200 W	LBB 1347/60	LBB 1347/70
1x 200 W +	LBB 1348/60	LBB 1348/70
1x 200 W slave		

The above mentioned /60 and /70 type amplifiers are not equipped with an input transformer standard mounted on the amplifier PCB.

2 DIFFERENT CONFIGURATIONS OF THE /30 AND /40 TYPE AMPLIFIERS

Since the introduction of the SQ45 different configurations (versions) have been built and delivered by the factory. Below an overview of existing versions related to serial numbers (next page).

2.1 DIFFERENT VERSIONS

Version A

This is the first supplied amplifier version equipped with an input transformer and asymmetrical input and 85° C capacitors on the amplifier PCB.

Version B

This is the amplifier version without input transformer mounted on the amplifier PCB, with a symmetrical input and with 105° C capacitors mounted.

Version C

The amplifier version without input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

Version D

The amplifier version with input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

2.2 SERIAL NUMBER OVERVIEW FOR THE DIFFERENT VERSIONS OF SQ45 AMPLIFIERS

All serial numbers mentioned are the first number of the range of that amplifier version.

See next page for serial numbers

SERIAL NUMBER OVERVIEW

<u>Type-number:</u>	<u>Version A</u>	<u>Version B</u>	<u>Version C</u>	<u>Version D</u>
LBB 1342/30	600	653	664	667
LBB 1342/40	600	935	1062	1097
LBB 1343/30	600	626	636	638
LBB 1343/40	600	924	957	969
LBB 1344/30	600	778	846	855
LBB 1344/40	600	1623	1872	1908
LBB 1346/30	600	620	627	628
LBB 1346/40	600	1215	1462	1489
LBB 1347/30	600	665	670	671
LBB 1347/40	600	1450	1719	1848
LBB 1348/30	600	747	791	803
LBB 1348/40	600	3294	4055	4393

NOTE: All /60 and /70 type-number versions are equipped according to version C

2.3 OVERVIEW AMPLIFIER MODULE VERSUS SQ45 TYPENUMBER

	<u>100W</u>	<u>2x 100W</u>	<u>1x 200W</u>	<u>SLAVE 1x 200W</u>
LBB 1342/xx	x (1)			
LBB 1343/xx		x (1)		
LBB 1344/xx			x (1)	
LBB 1346/xx		x (2)		
LBB 1347/xx			x (2)	
LBB 1348/xx			x (1)	x (1)

NOTE: /xx stands for /30, /40, /60, /70

3 AMPLIFIER INPUTS

- a.- All amplifier versions B, C and D have electronically balanced inputs on the new amplifier modules.
- b.- All amplifier versions B and C do not have an input transformer mounted on the PCB.

NOTE: For descriptions of the versions refer to paragraph 2.1.

NOTE: In case amplifiers with modules according to version B, C or D (symmetrical inputs) are mixed up with amplifiers with modules version A (asymmetrical inputs) is it necessary to short-circuit point 4 and 2 of the Call-test- input DIN connector (male).
This will prevent problems with surveillance line-up procedures.

In case an application requires galvanically isolated inputs an input transformer can still be mounted on the amplifier PCB.

When installing a transformer on a PCB the following modification has to be carried out:

- a.- Install a transformer at the place on the PCB that is designated for it.
- b.- Remove following components:

On the 1x 100W and 1x 200W modules
R111, R112, R123, R132

On the 2x 100W module
R24, R124, R25, R125, R208, R228, R239, R249

4 SPARE PARTS

The Spare Part ordering numbers for the modules according to versions C and D are listed below.

The amplifier modules are backwards compatible with the older versions A and B. The Spare-Part ordering numbers for these modules have been cancelled.

1 x 100W - module without input transformer	: 5322 310 10527
1 x 200W - module without input transformer	: 5322 310 10439
2 x 100W - module without input transformers	: 5322 310 10435
1 x 100W - module with input transformer	: 5322 214 91303
1 x 200W - module with input transformer	: 5322 214 91304
2 x 100W - module with input transformers	: 5322 214 91305
REM-DC.AC Power supply module	: 5322 310 10437

Please have these numbers added to your Service Manual and delete the old ones in order to prevent mistakes.

H. Verstallen
Customer Support
Supply Centre - Breda
Holland

SQ45 Amplifier range

Supply Centre Breda

8.6 Service Information : 4822 861 05045

(01-09-1994)

SERVICE DOCUMENTATION: 4822 733 24397



PHILIPS

Service Information

Communication & Security Systems

Date : 1 November 1993

Category : Modification

Article group : SAG 6100
Customer Support
Supply Centre - Breda

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Decrease of reliability due to high ambient
temperatures when SQ45 amplifiers are mounted in
19 " racks.

Contents : See contents list (page 2)

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2	CORRECTIVE ACTION IN THE FIELD	3
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1 PROBLEM DESCRIPTION

Problems with SQ 45 amplifiers can occur when more of these amplifiers are mounted in 19 " racks and a permanent 20 kHz surveillance mode is applied and/or a too high capacitive load is connected to the output of the amplifier.

Due to the additional power dissipation caused in this case, a temperature build up will take place in the amplifier.

This will, after some time, result in defective capacitors on the Power Amplifier modules. The capacitors have a limited lifetime at higher temperatures.

2. CORRECTIVE ACTION IN THE FIELD

To eliminate potential problems in the above type of installations, field modifications have to be carried out on a certain number of SQ45 amplifiers.

For a detailed overview of which units have to be modified, refer to the following paragraphs.

The modification can be carried out during preventive or corrective maintenance.

The modification can be divided into the following steps:

- a. Modify the amplifier module.
- b. Modify the power supply unit.

NOTE: It is essential that the SQ45 amplifiers are used within the specified ambient temperature. The maximum temperature is 55° C. Care has to be taken that the air inside the 19" cabinet is sufficiently cooled and the maximum permissible temperature is never exceeded.

3. DIFFERENT VERSIONS OF /30 AND /40 SQ45 AMPLIFIERS

3.1 BRIEF DESCRIPTIONS OF THE VERSIONS

Version A

This is the first supplied amplifier version equipped with an input transformer and asymmetrical input and 85° C capacitors on the amplifier PCB.

Version B

This is the amplifier version without input transformer mounted on the amplifier PCB, with a symmetrical input and with 105° C capacitors mounted.

Version C

The amplifier version without input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

Version D

The amplifier version with input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

3.2 SERIAL NUMBER OVERVIEW FOR THE DIFFERENT VERSIONS OF SQ45 AMPLIFIERS

All serial numbers mentioned are the first number of the range of that amplifier version.

See next page for the overview

SERIAL NUMBER OVERVIEW

<u>Type-number</u>	<u>Version A</u>	<u>Version B</u>	<u>Version C</u>	<u>Version D</u>
LBB 1342/30	600	653	664	667
LBB 1342/40	600	935	1062	1097
LBB 1343/30	600	626	636	638
LBB 1343/40	600	924	957	969
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LBB 1344/40	600	1623	1872	1908
LBB 1346/30	600	620	627	628
LBB 1346/40	600	1215	1462	1489
LBB 1347/30	600	665	670	671
LBB 1347/40	600	1450	1719	1848
LBB 1348/30	600	747	791	803
LBB 1348/40	600	3294	4055	4393

3.3 SQ 45 AMPLIFIERS THAT ARE ALREADY MODIFIED

All version C and D amplifiers are not subject to this modification.
The 200W slave amplifier in the LBB 1348/xx is not subject to this modification.

4 MODIFICATIONS

All modifications can be carried out by exchanging components.
After modification only a simple test is necessary to verify the functioning of the amplifier. This test is limited to comparing the input versus the output and using an oscilloscope to view the sine-wave.

The actual modification depends on the type of amplifier module and the version and is described in more details in the next paragraphs.

4.1 VERSION 'A' AMPLIFIERS

NOTE: Following components must be changed / added to modify the version 'A' amplifier modules and power supply module (85° C capacitors).

For serial number identification refer to paragraph 3.2.

Version 'A' -> 1 x 100W and 1 x 200W module:

C14, C42, C43	:	47uF/40V (125°C)
C25, C36, C46	:	10uF/63V "
C30	:	22uF/63V "
C10, C16, C23	:	1uF
C20, C21, C37, C38	:	220nF
R13	:	PTC 60°C
R89 (add)	:	680E (MRS25)

Version 'A' -> 2 x 100W module:

C51, C151	:	220uF (125°C)
C42, C43, C142, C143,		
C14, C114	:	47uF/40V "
C46, C146, C125, C36,		
C136	:	10uF/63V "
C30, C130	:	22uF/63V "
C10, C110, C16, C116	:	1uF
C20, C21, C120, C121,		
C37, C38, C137, C138	:	220nF
R13	:	PTC, 60°C
R89, R189 (add)	:	680E (MRS25)

Version 'A' -> Power supply module:

C2	:	47uF/40V (125°)
C24, C25	:	22uF/100V "
C20	:	220nF
R46 changed into D: BZX79B27		

4.2 VERSION 'B' AMPLIFIERS

NOTE: Following components must be changed to modify the version 'B' amplifier modules (105° C capacitors) and power supply module (85°C capacitors).

For serial number identification refer to paragraph 3.2.

Version 'B' -> 1x 100W and 1x 200W module:

C1, C21, C42, C43	:	47uF/40V (125°C)
C25, C27, C36, C46, C47	:	10uF/63V "
C23, C30	:	22uF/63V "
C14, C15	:	1uF
C20, C37, C38	:	220nF
R13	:	PTC, 60°C

Version 'B' -> 2x 100W module:

C1, C101, C21, C121,	
C42, C43, C142, C143	: 47uF/40V (125°C)
C27, C127, C125, C36,	
C136, C46, C146, C47, C147	: 10uF/63V "
C30, C130	: 22uF/63V "
C14, C114, C15, C115	: 1uF
C20, C120, C37, C137,	
C38, C138	: 220nF
R13	: PTC 60°C

Version 'B' -> power supply module:

C2	:	47uF/40V (125°)
C24, C25	:	22uF/100V "
C20	:	220nF

R46 changed into D: BZX79B27

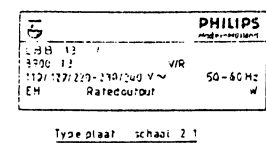
5 MODIFICATION KITS

The listed components in paragraph 4 are not available from Philips Consumer Service, but can be ordered as a complete modification kit from the Supply Centre - Breda (Logistics Dept.).

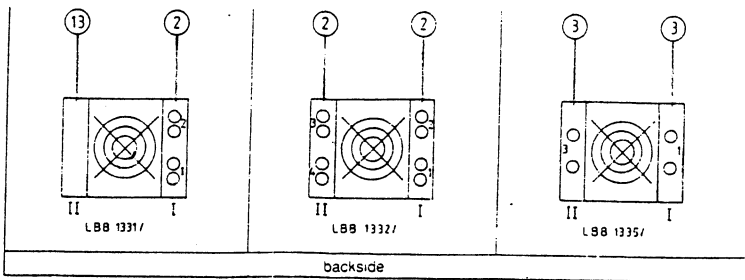
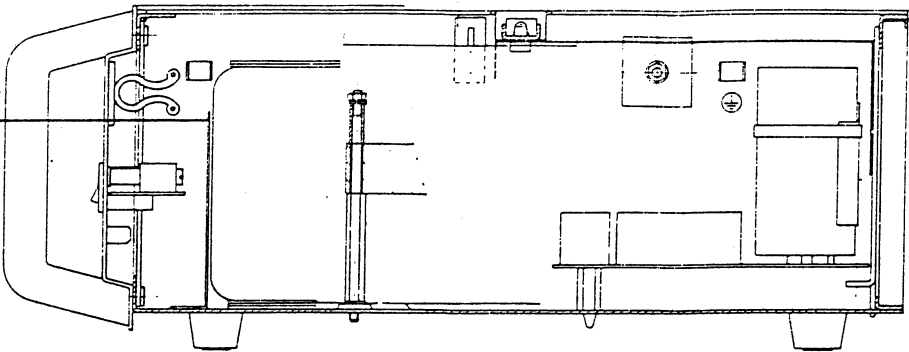
NOTE: These orders will be accepted till 01-03-1994 and will be delivered free of charge.

The ordering code number for the modification kits are as follows:

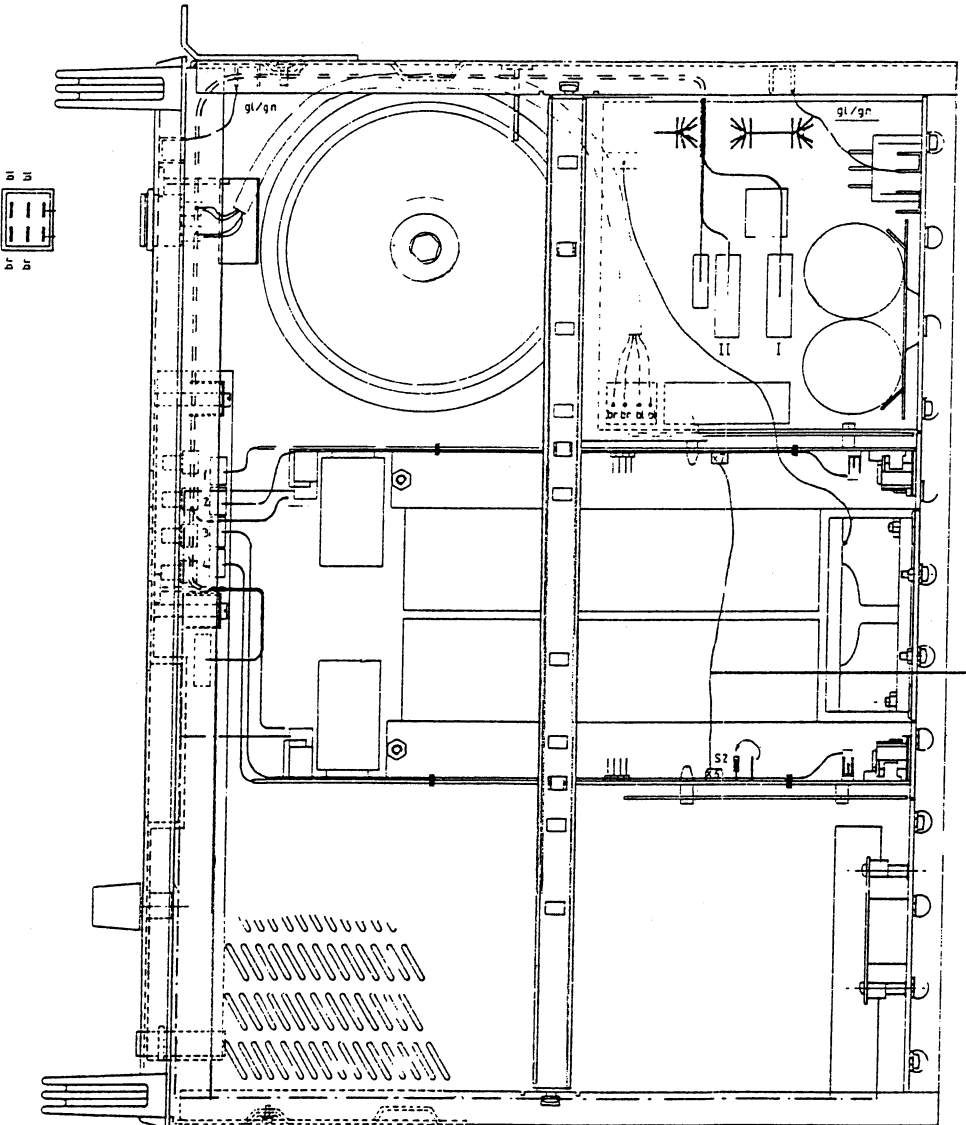
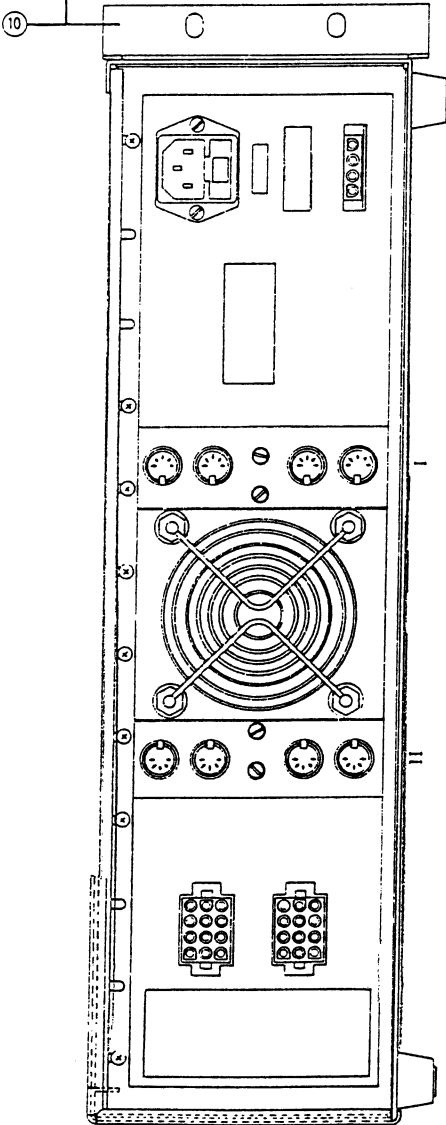
8993 932 00101	For the 1x 100W or 1x 200W PCB (version A or B).
8993 932 00111	For the 2x 100W PCB (version A or B).
8993 932 00121	For the power supply PCB (version A or B).



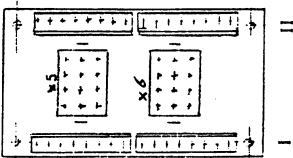
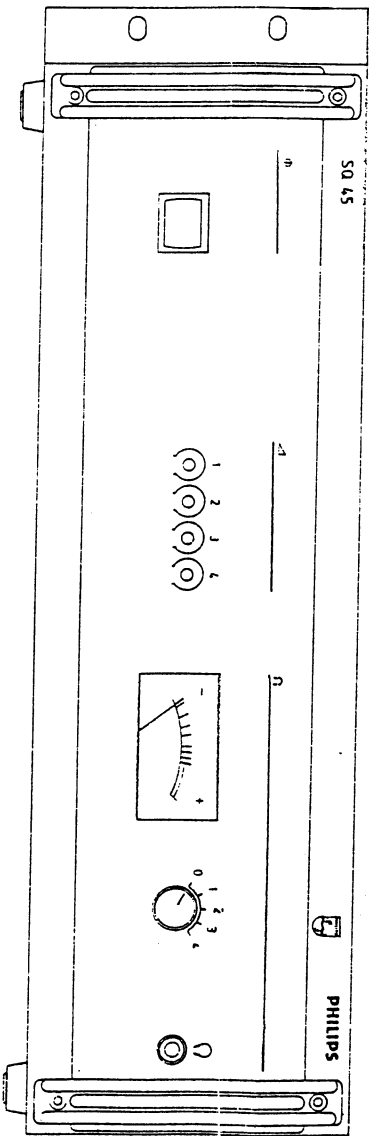
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LBB 1332/00/20/3a/50
LBB 1335/00/10/3a/40

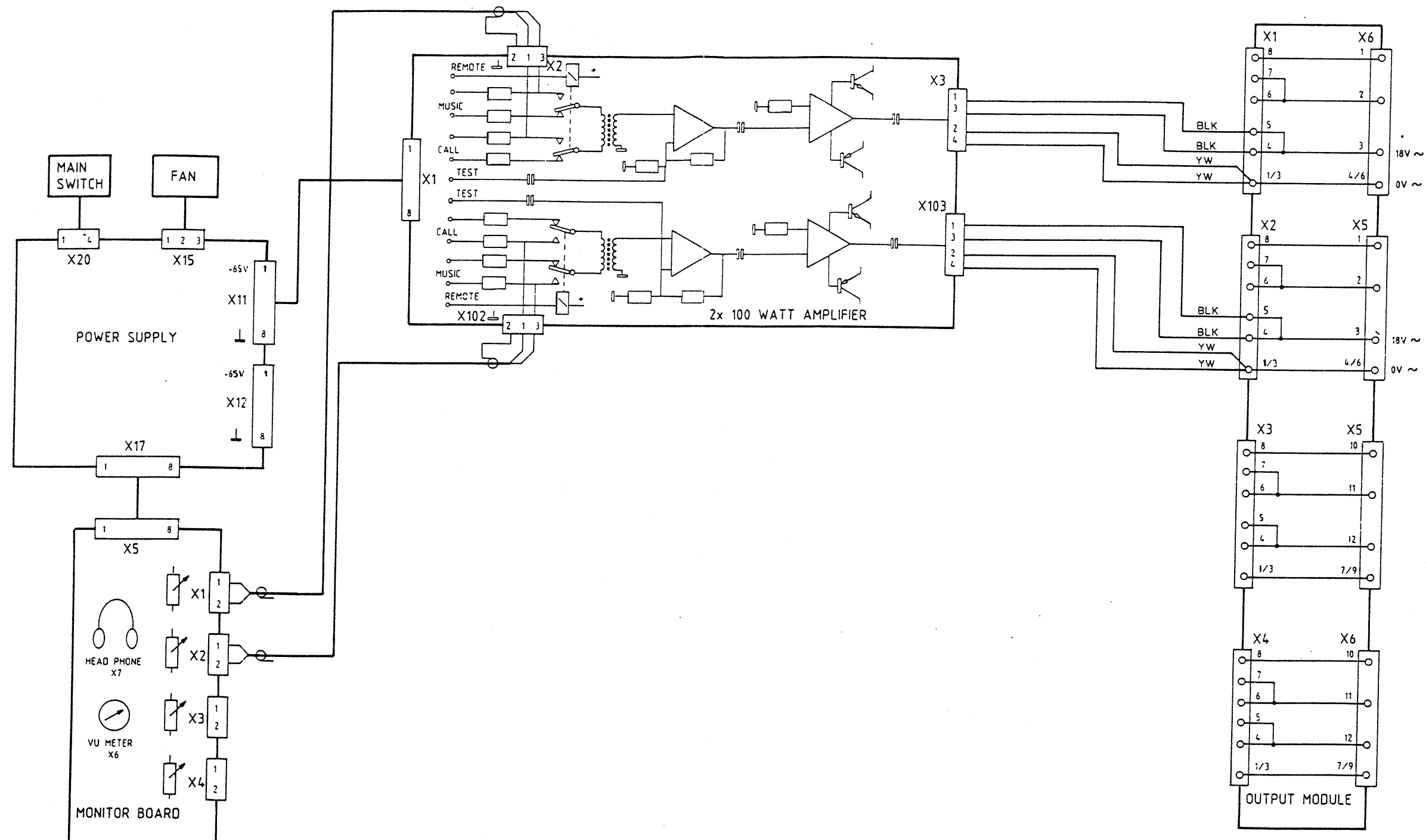


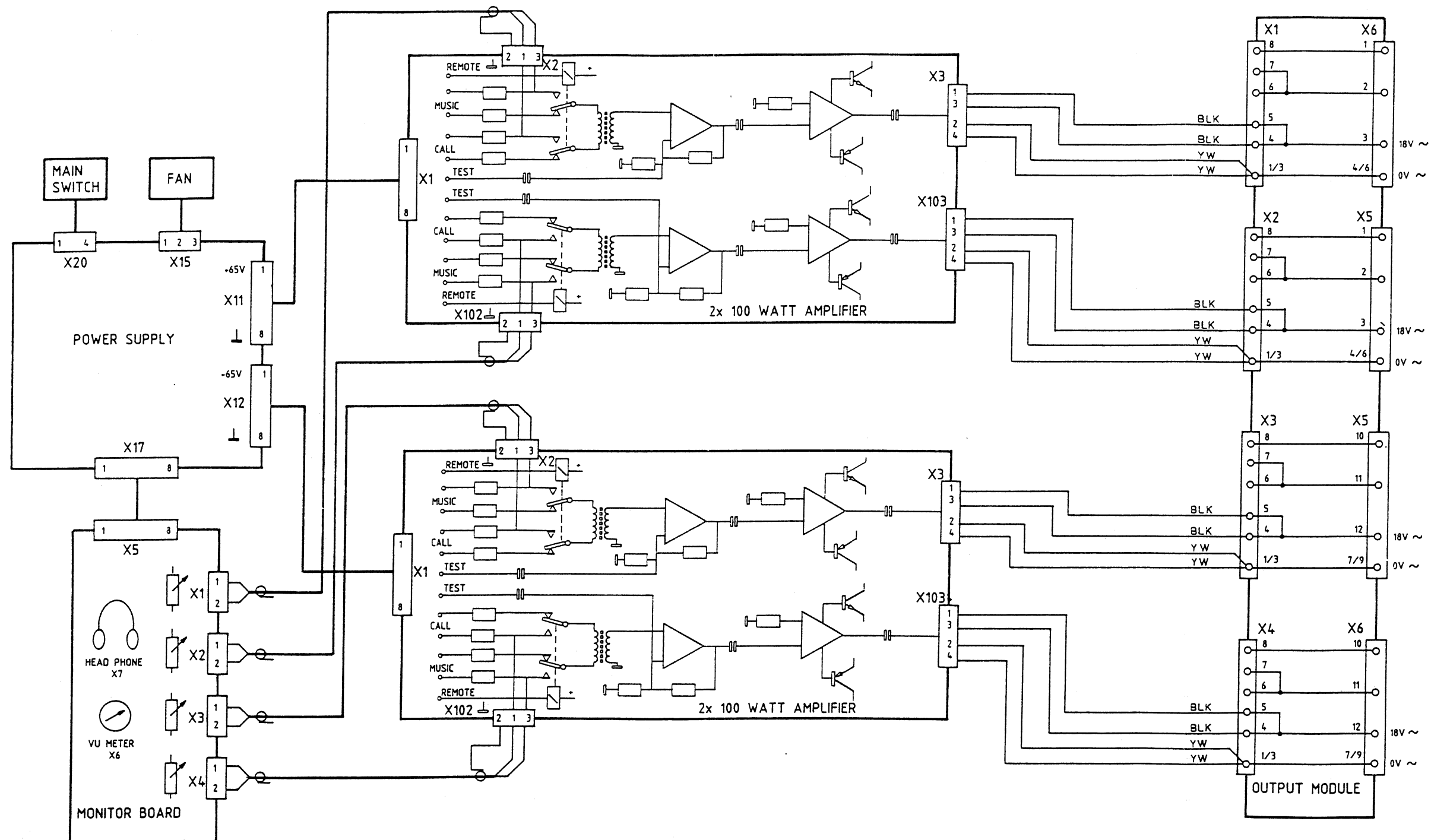
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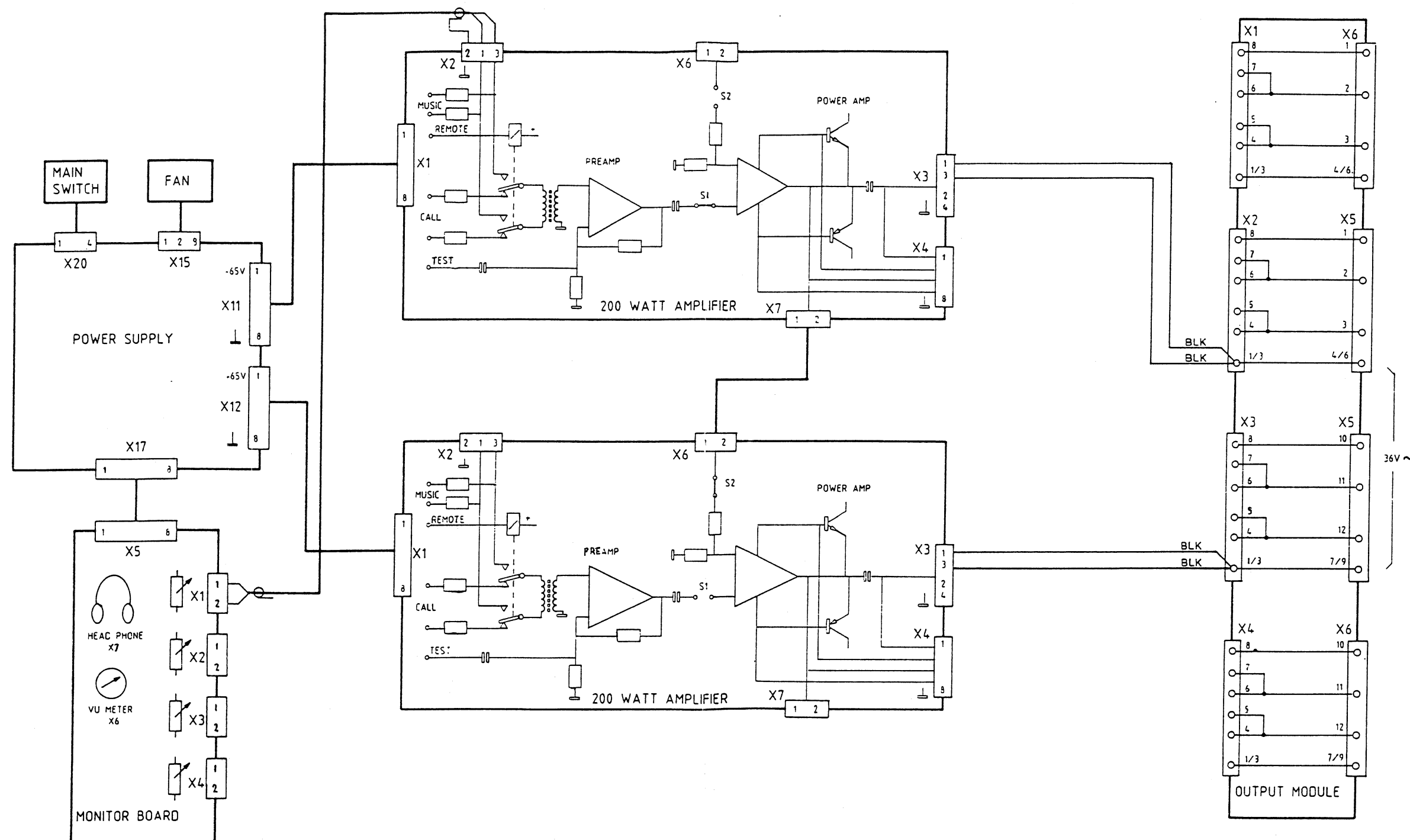


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for LBB 1335/ --
pos. 12







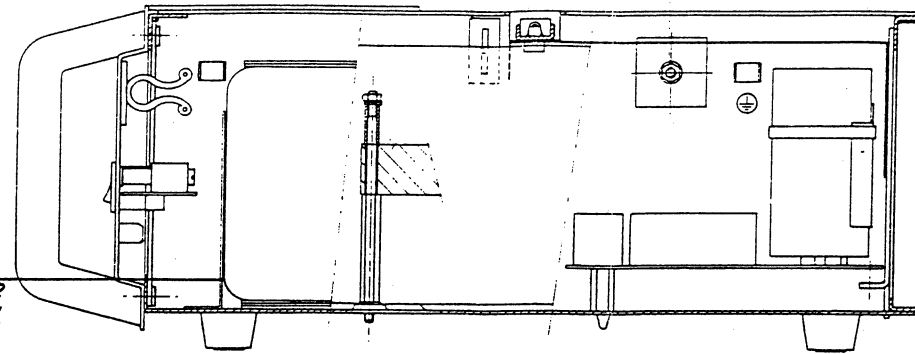


Supply Centre Breda

PHILIPS	
LBB 13	8900 13
110/127/230-230/240 V~	50-50 Hz
EH	Rated output

P		S	
LBB 13	8900 13	20	VIR
EH	Rated output	42-73V	W 87.5kV

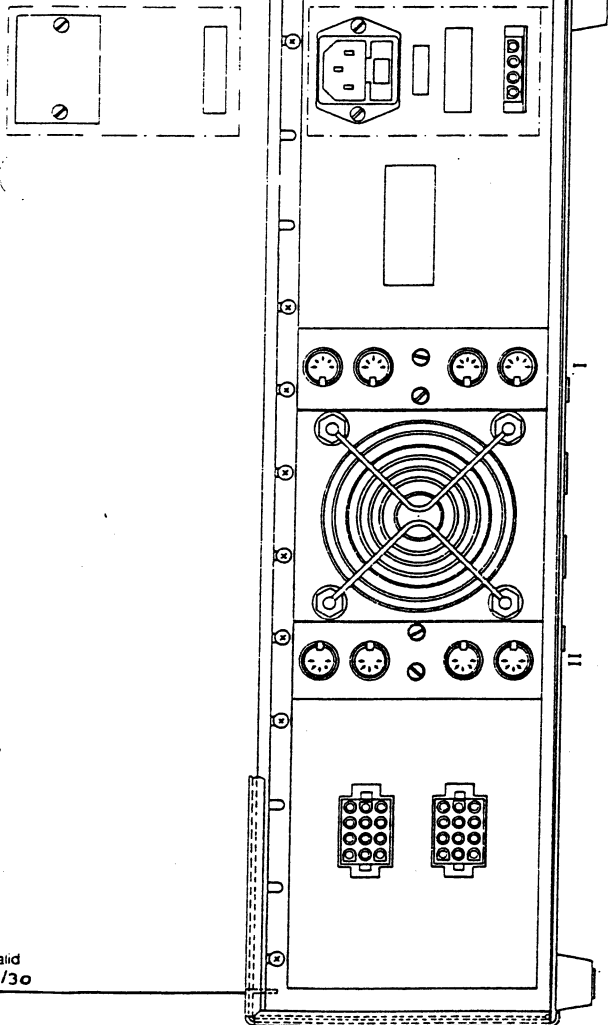
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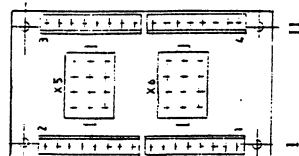
only valid for
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1348 /00 en /10

only valid for
/10 - /20 - /40 - /50

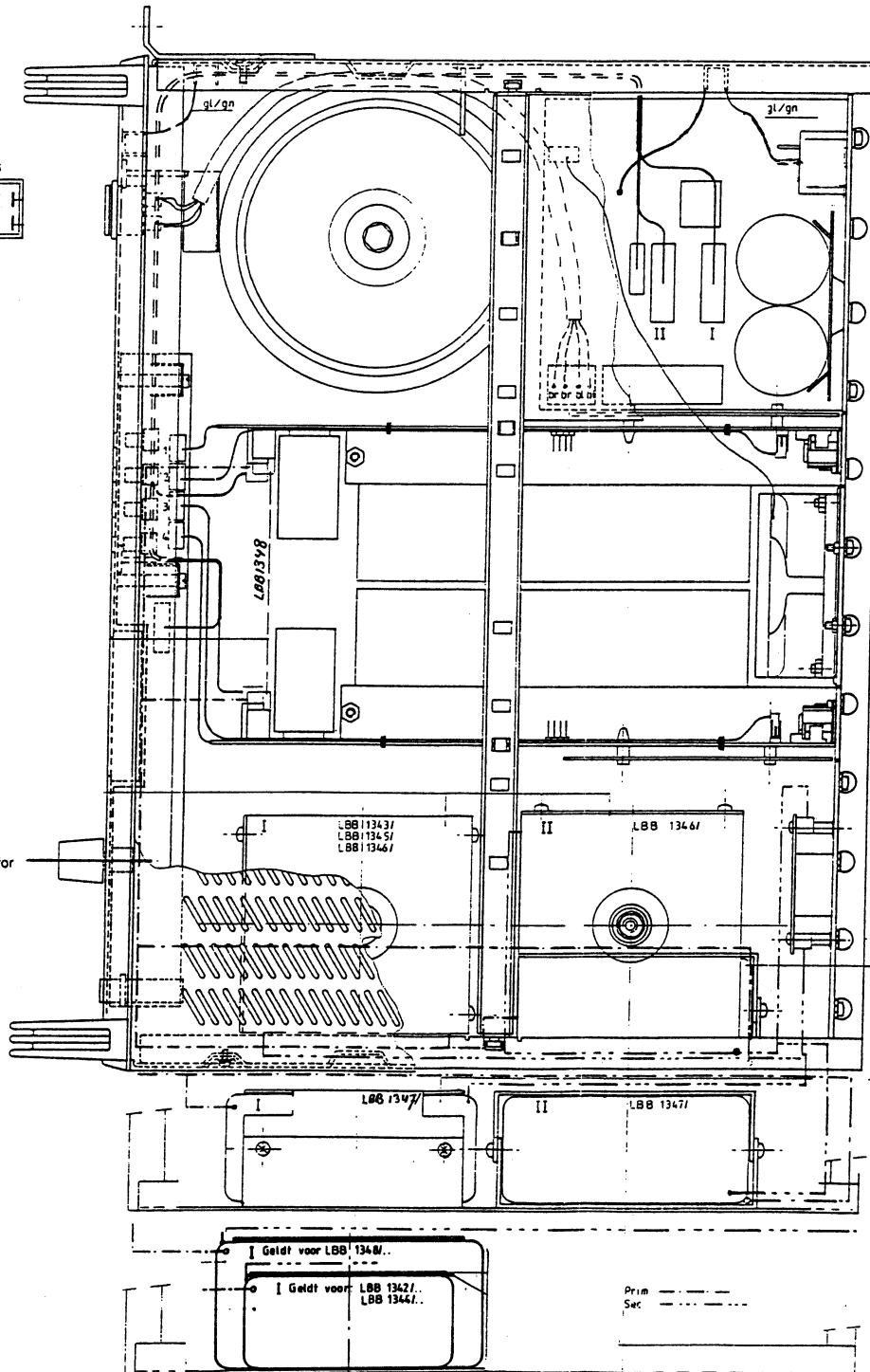
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only valid
or /00/30



only valid for
LBB 1348



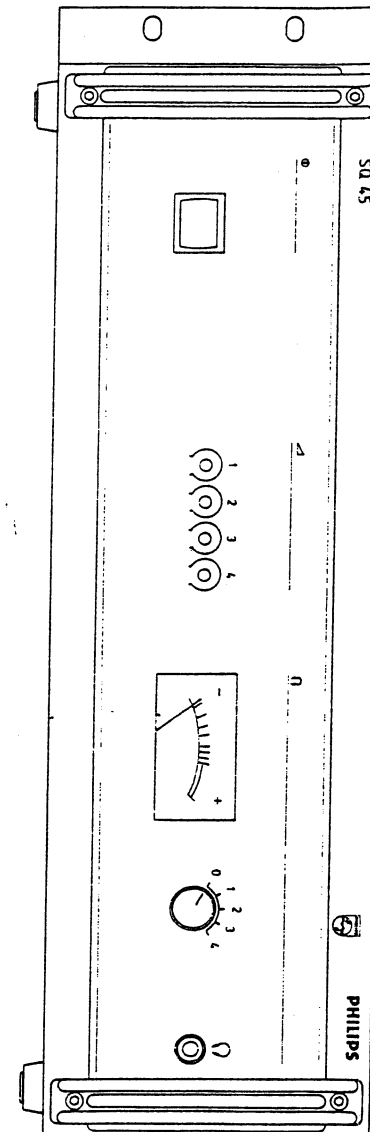
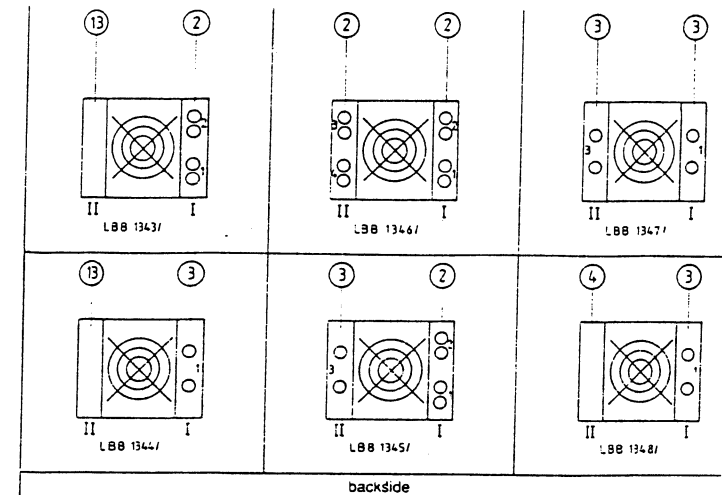
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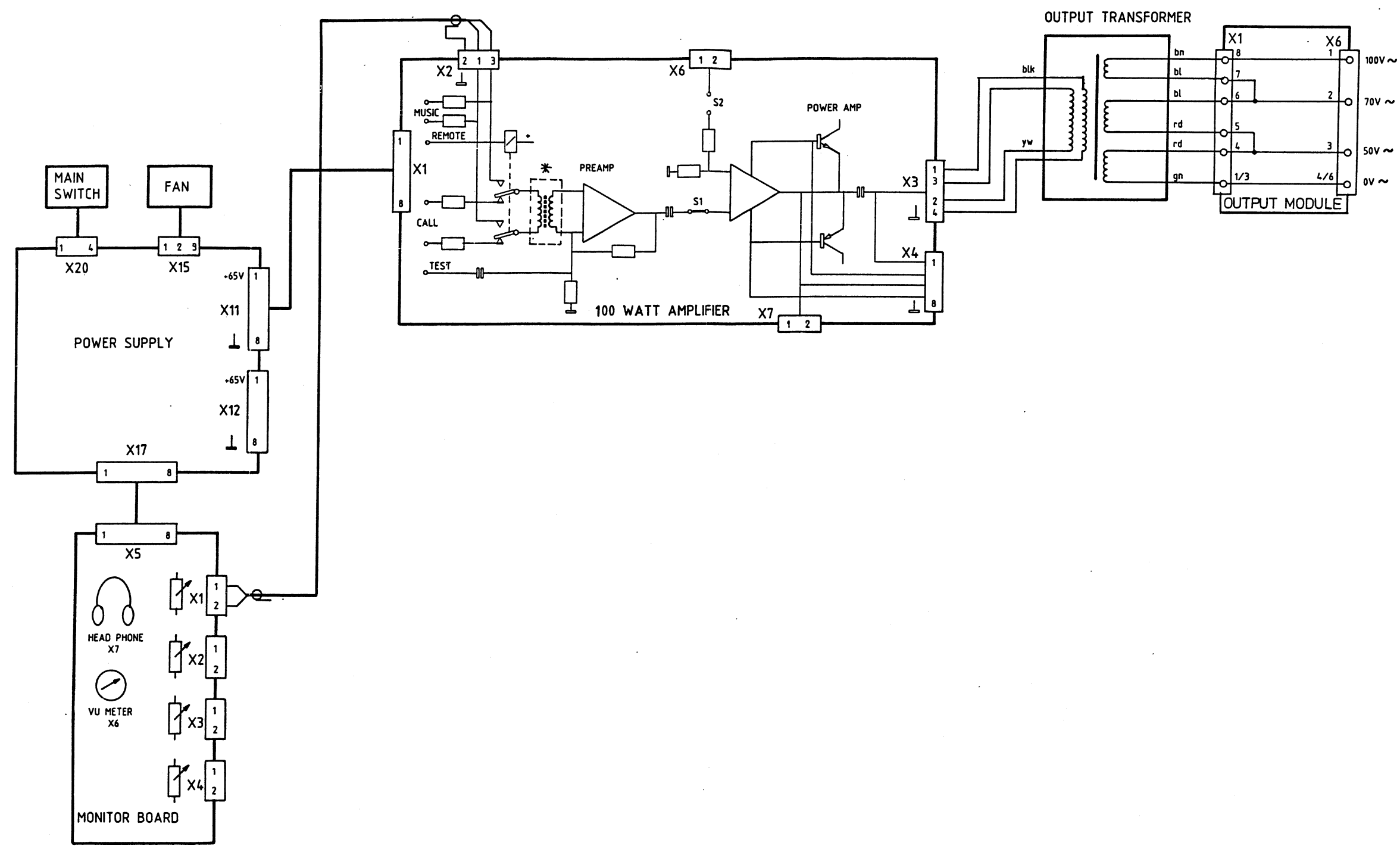
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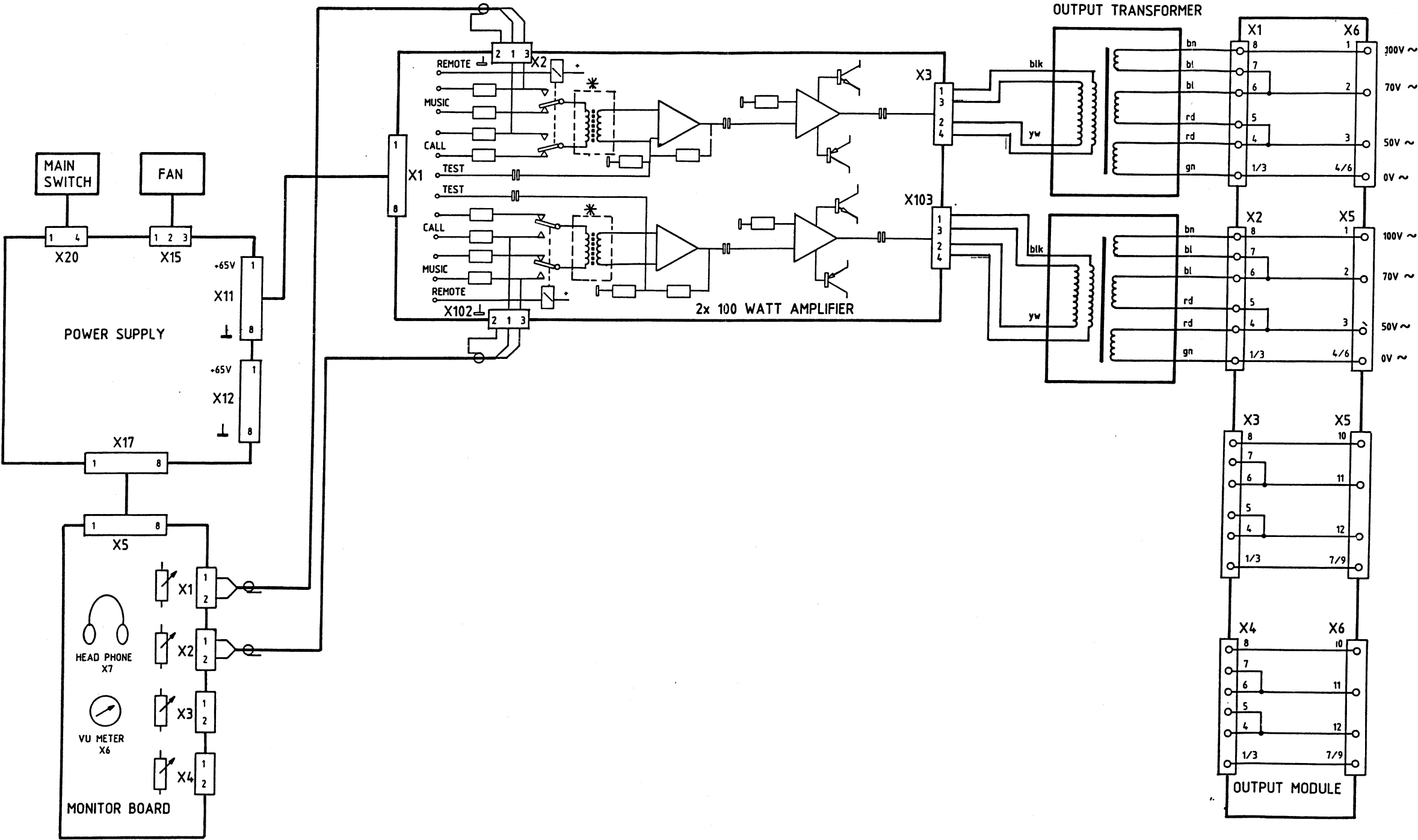
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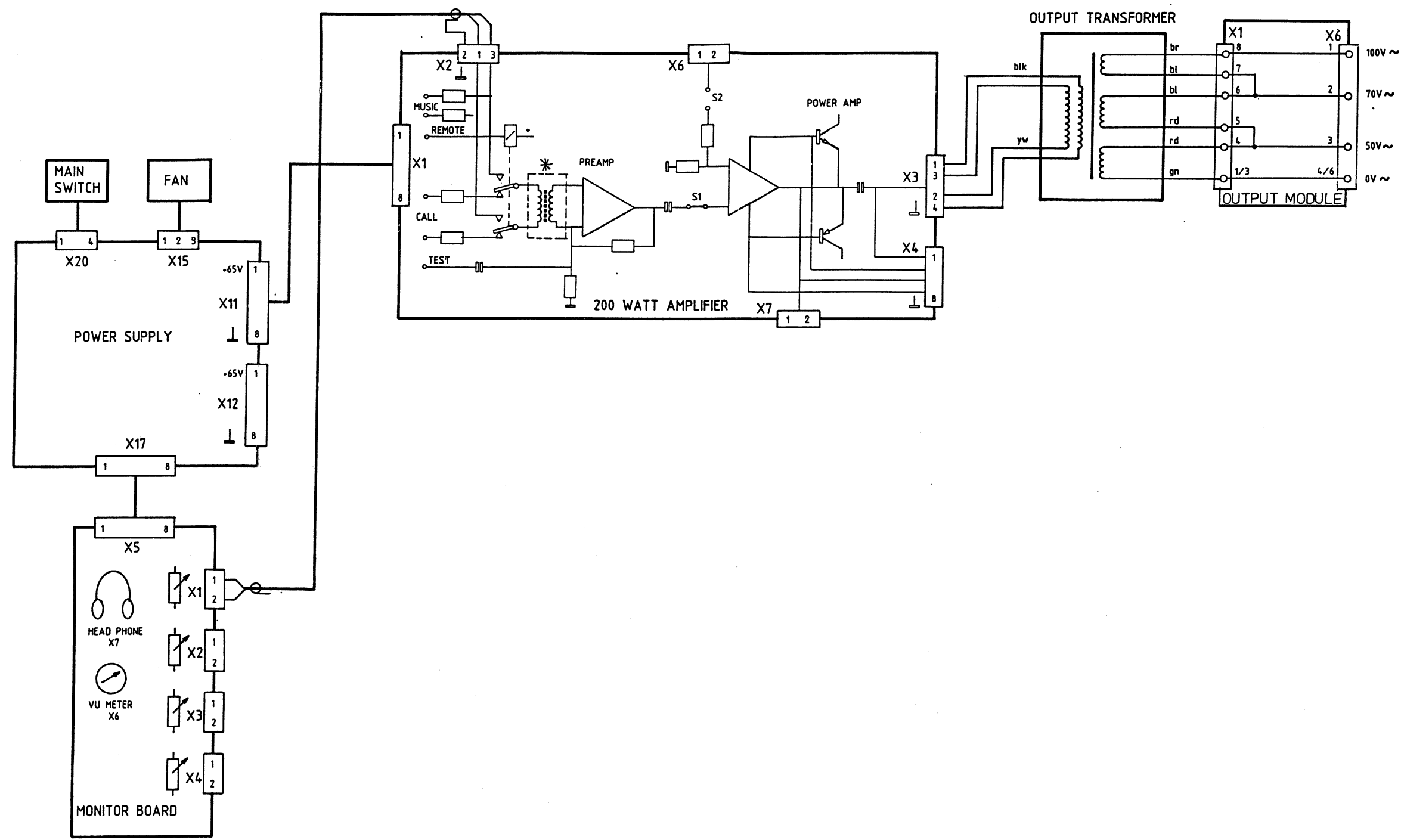
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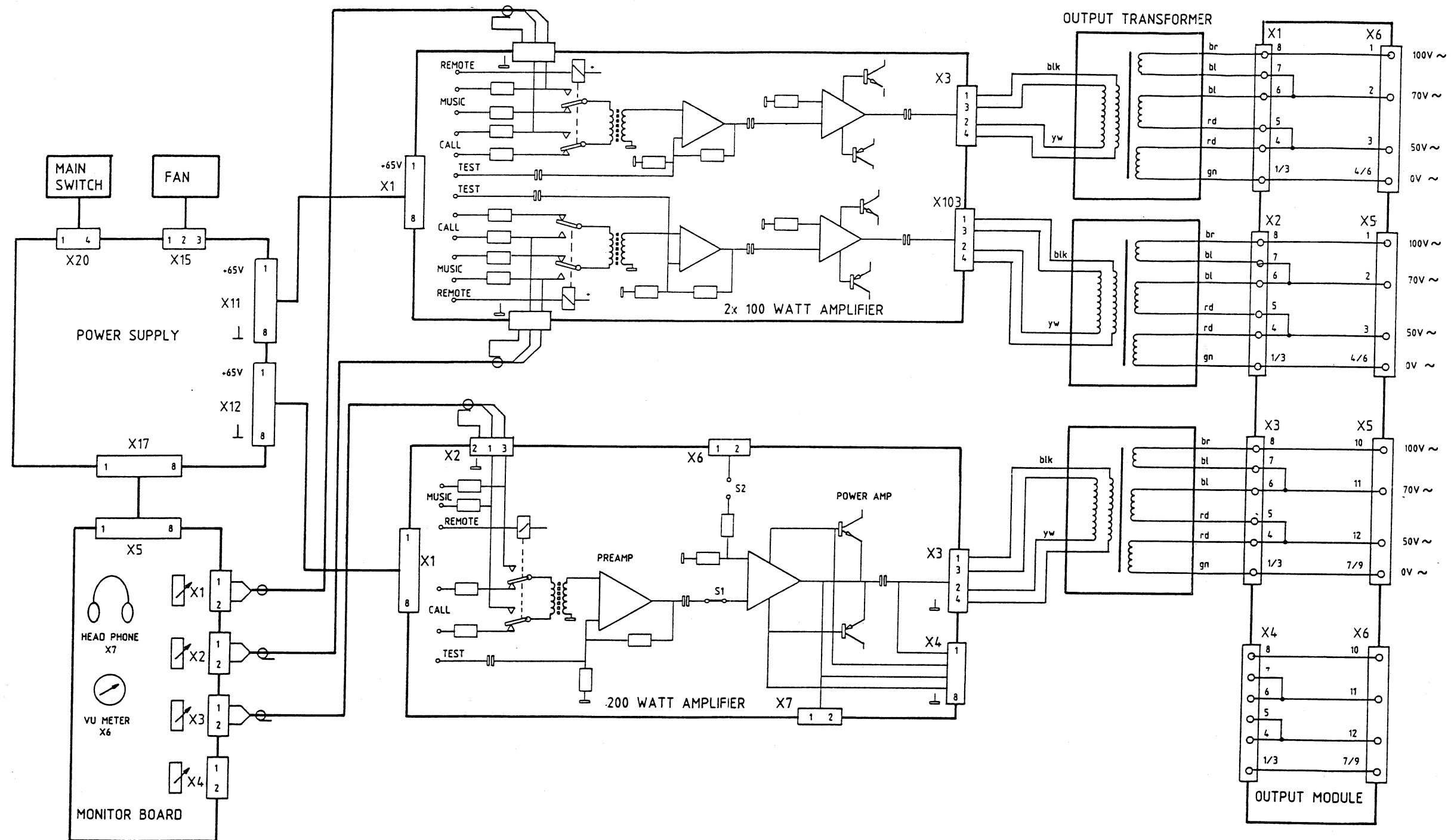
SQ45 Amplifier range

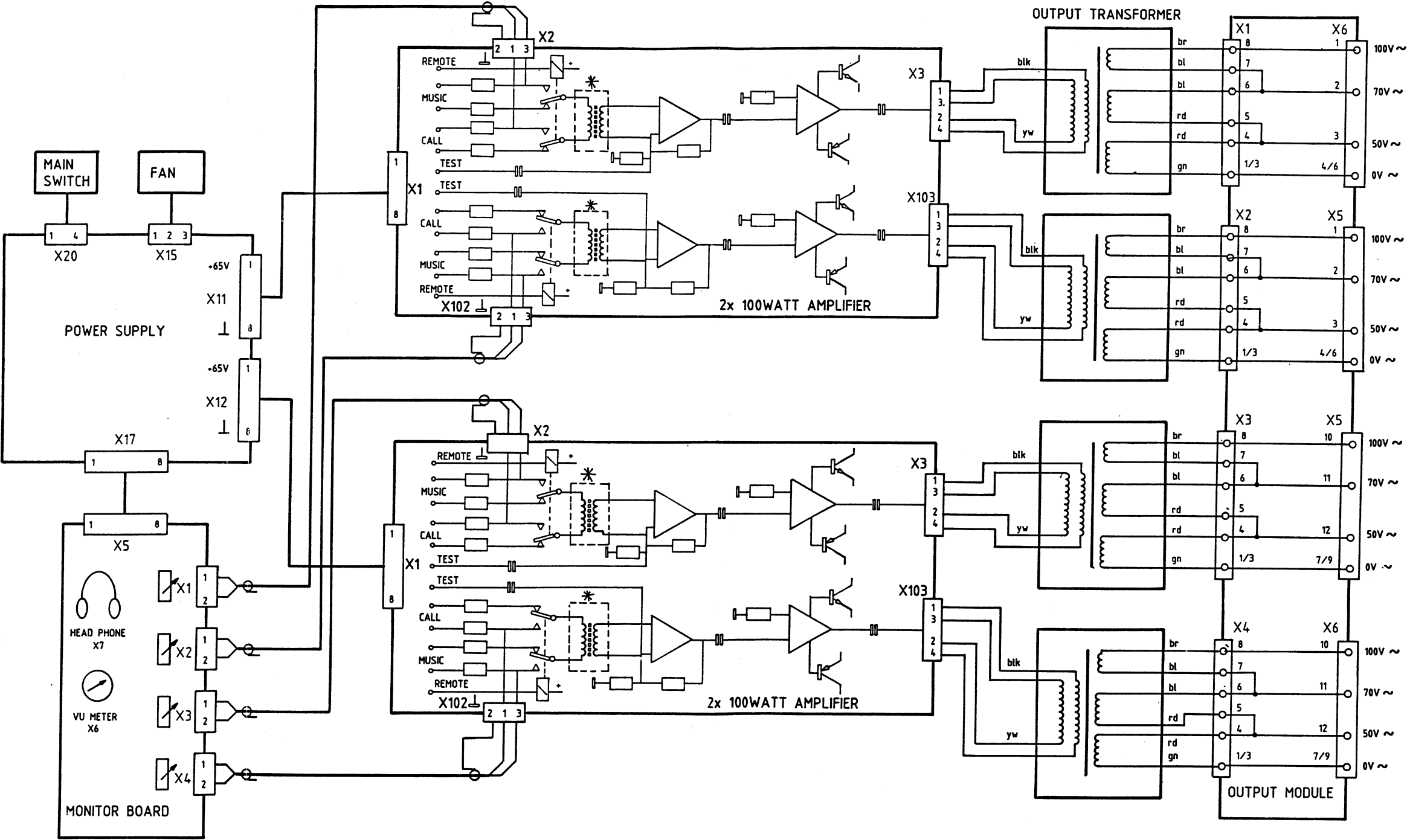


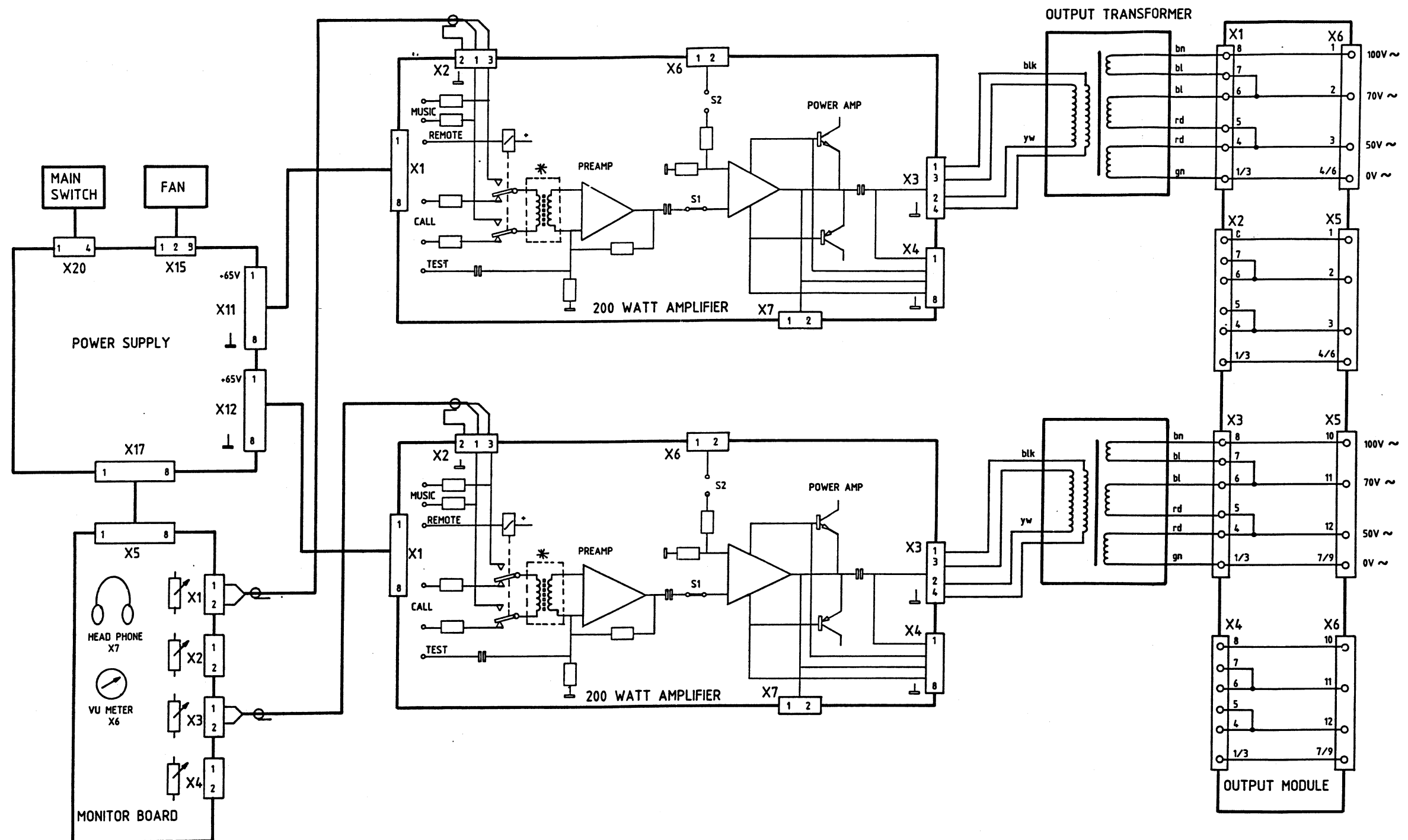


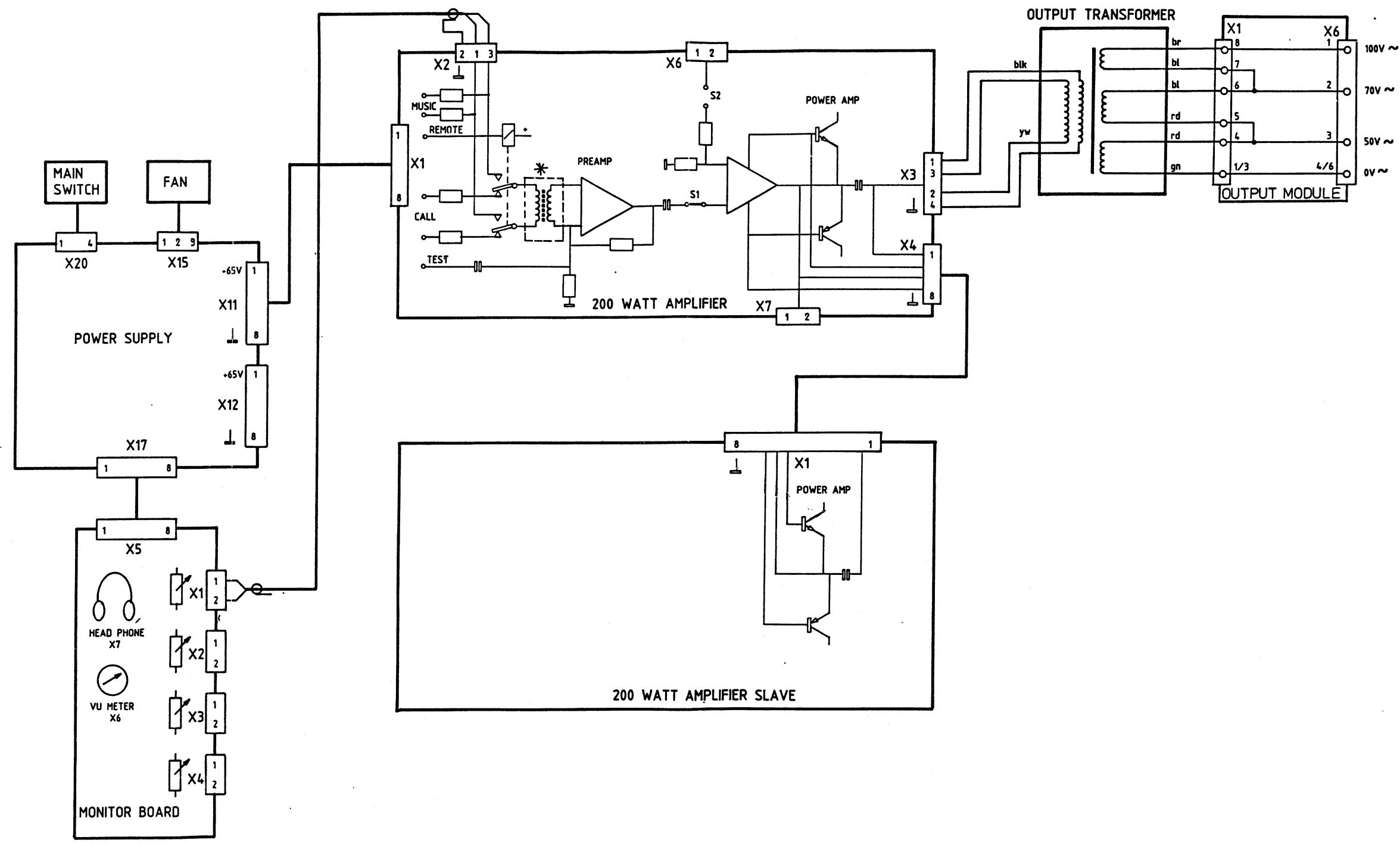


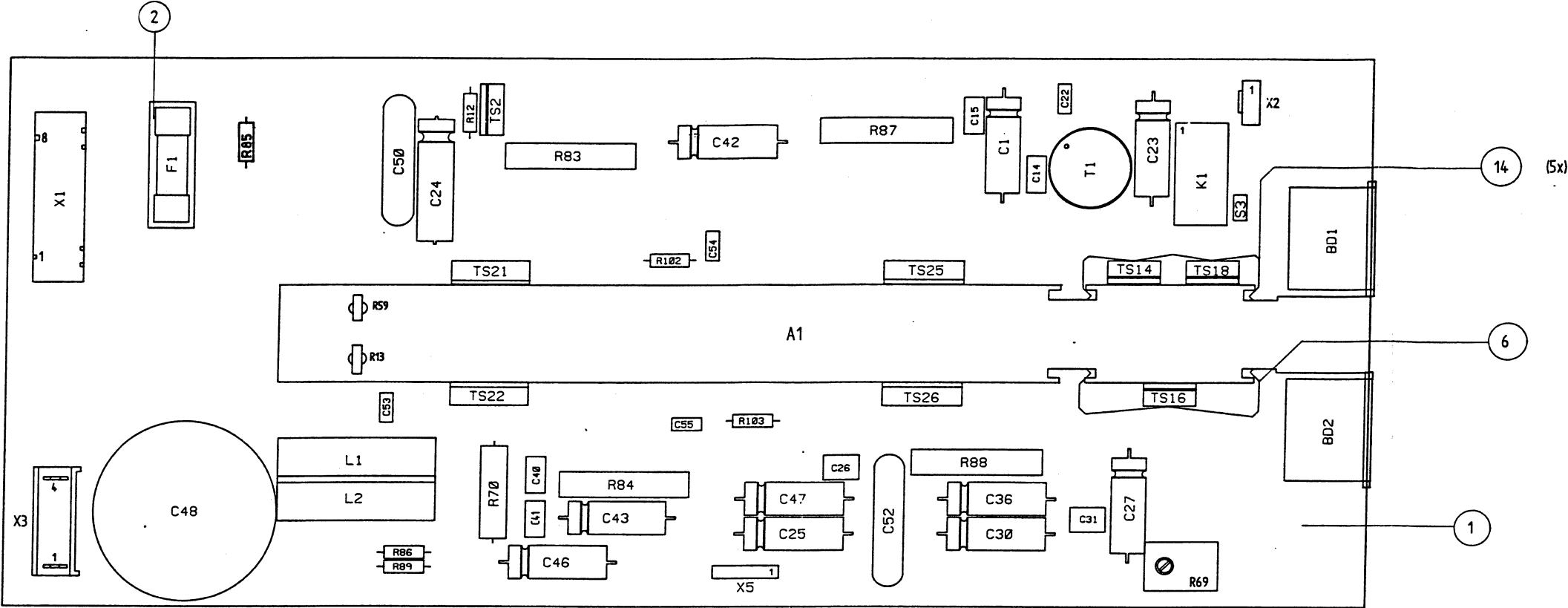






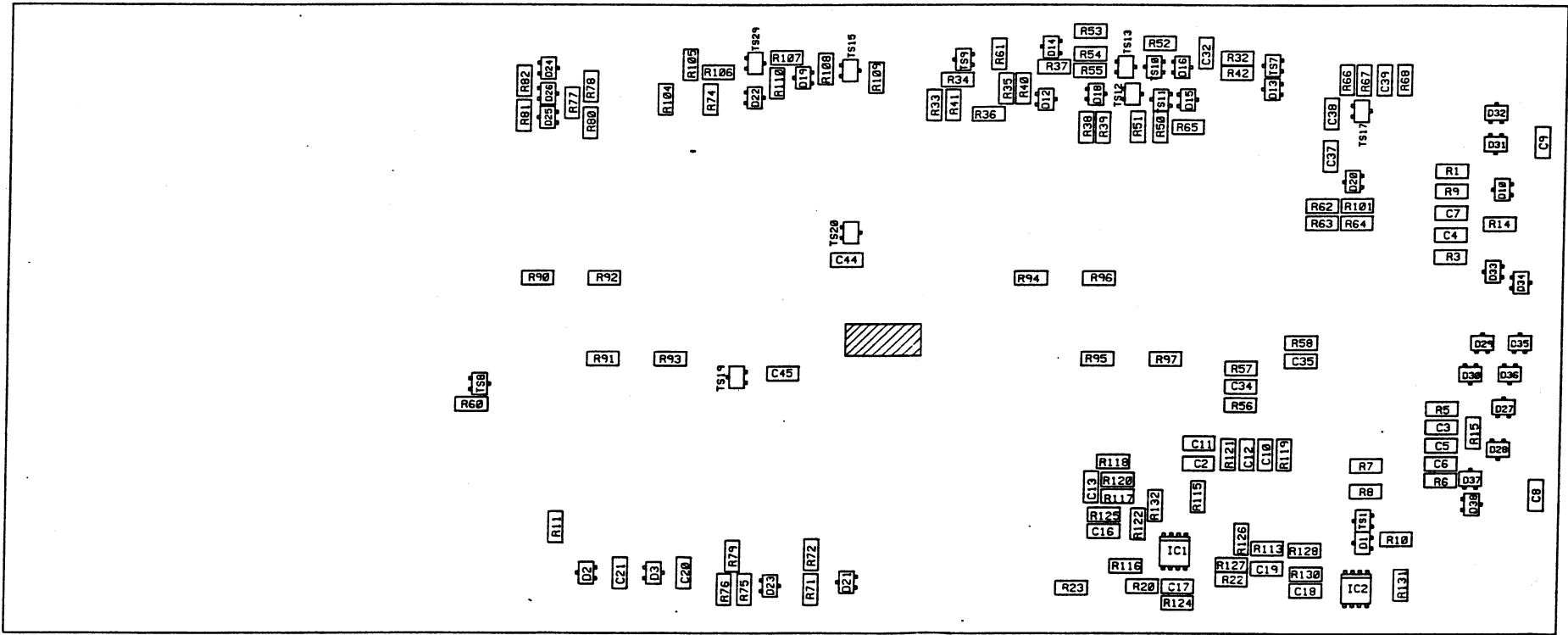


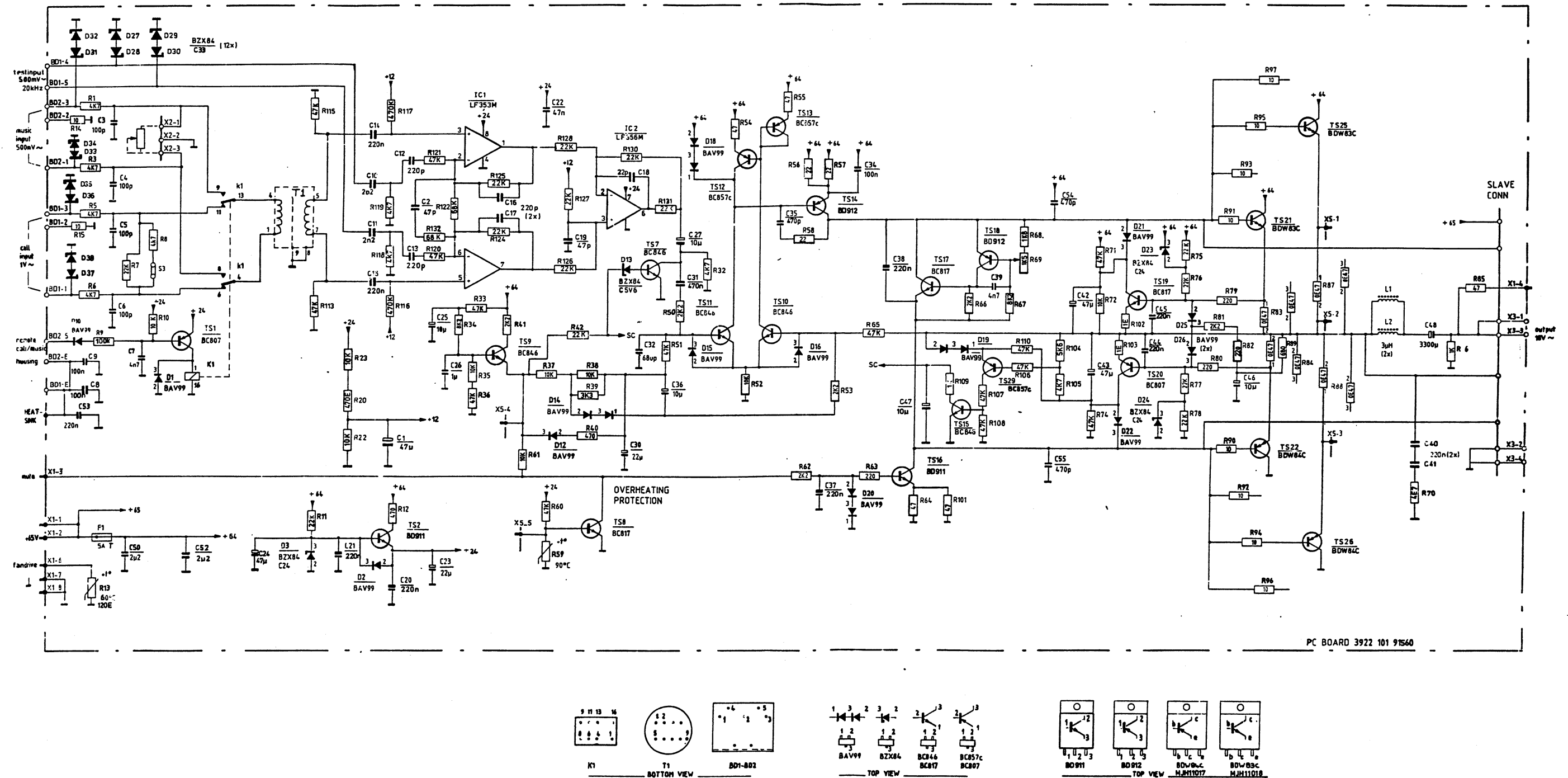




TOP VIEW

3922 101 91560 PRENTPANEEL
PRINTED BOARD

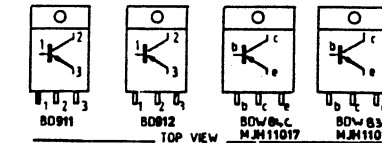
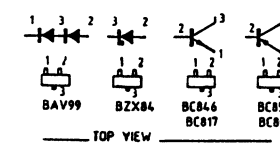
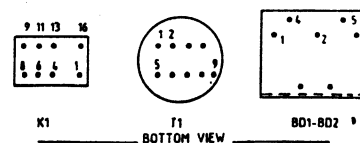
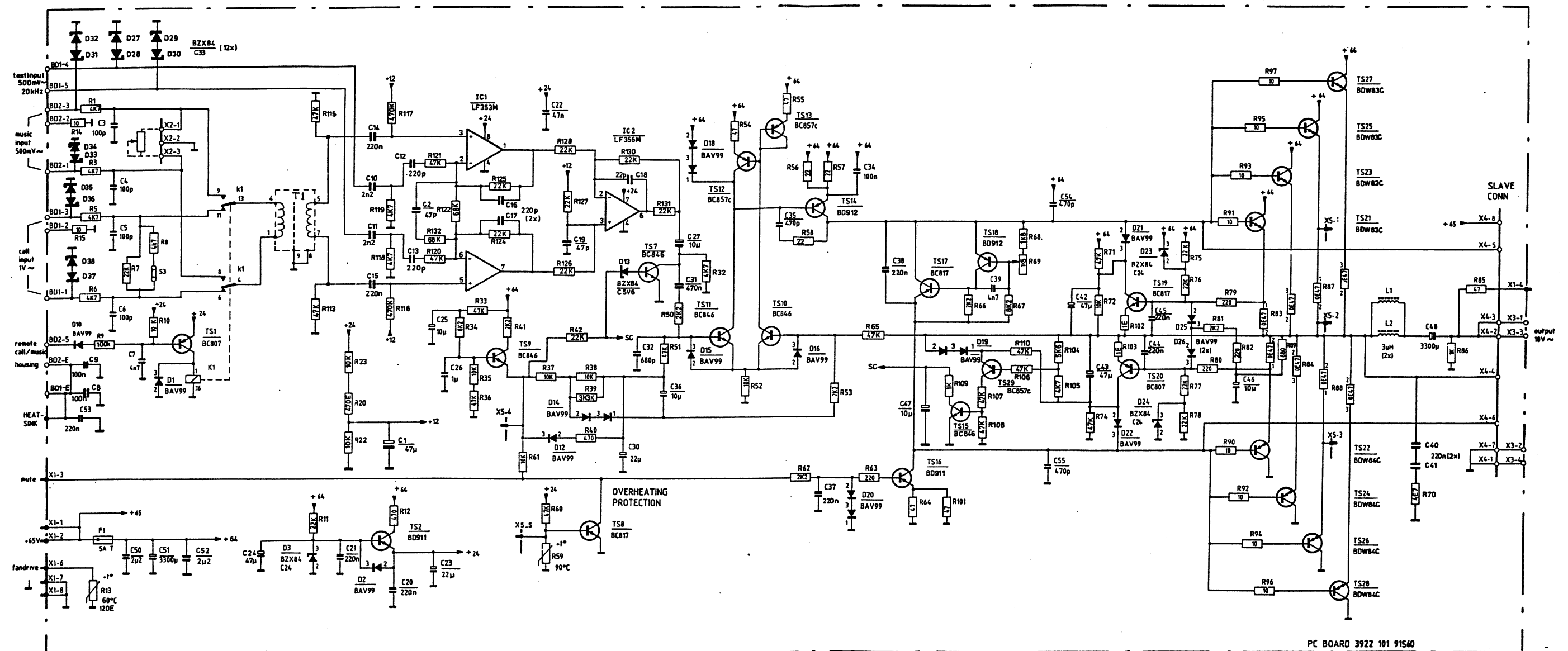


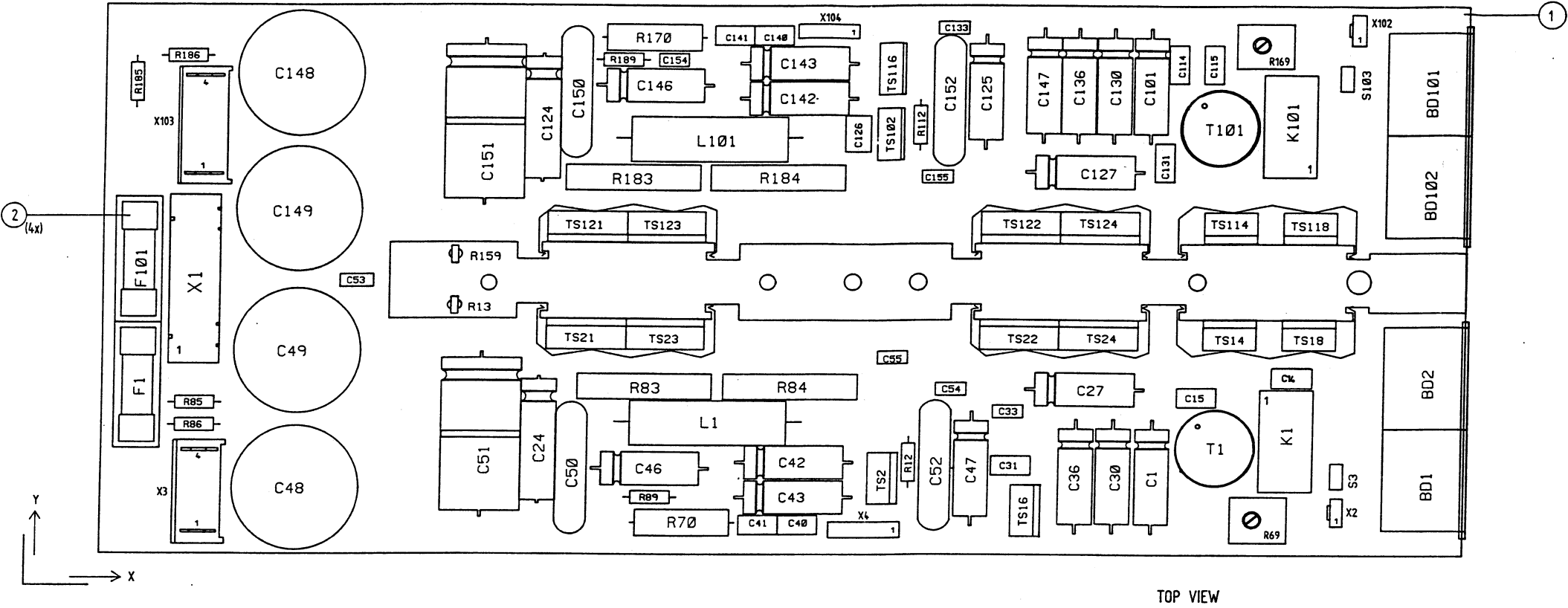




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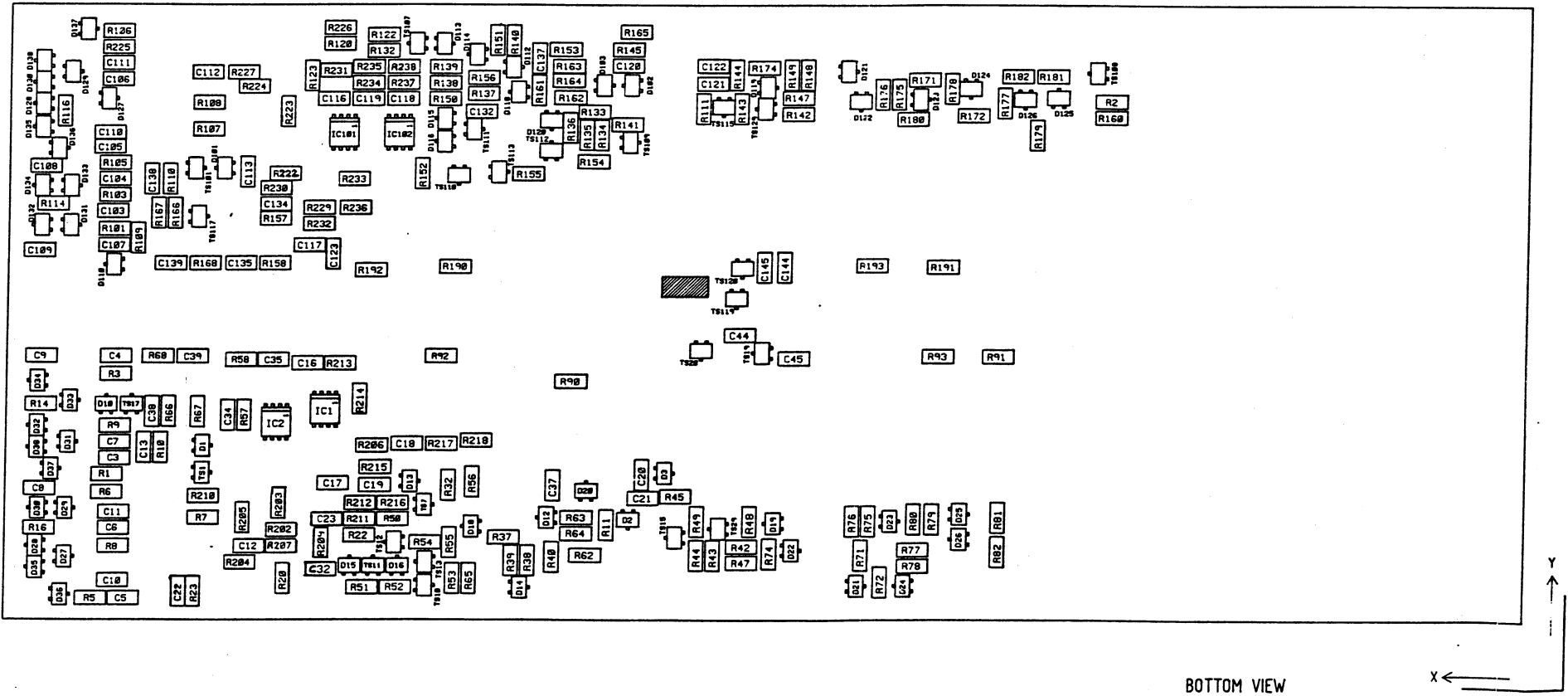




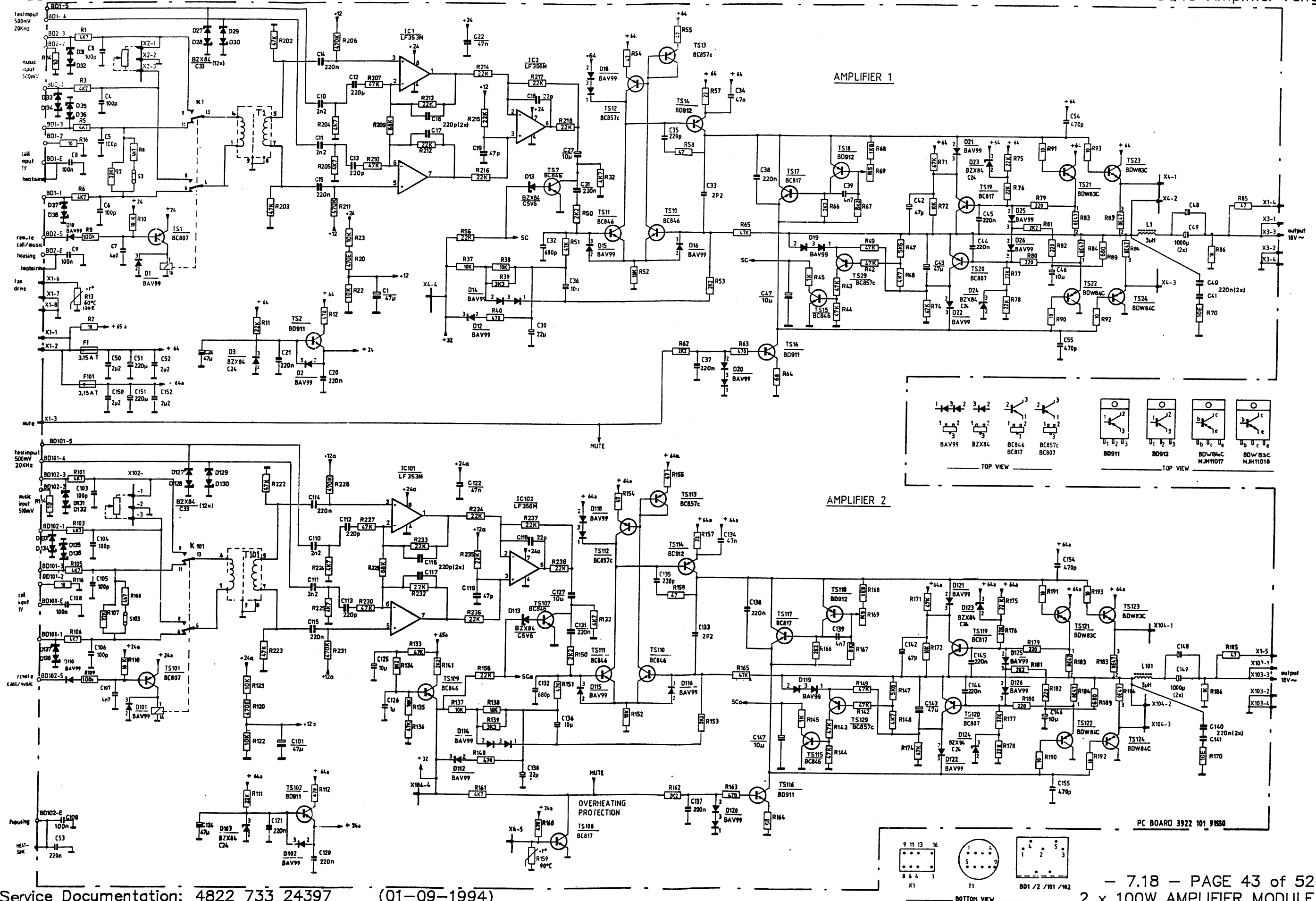


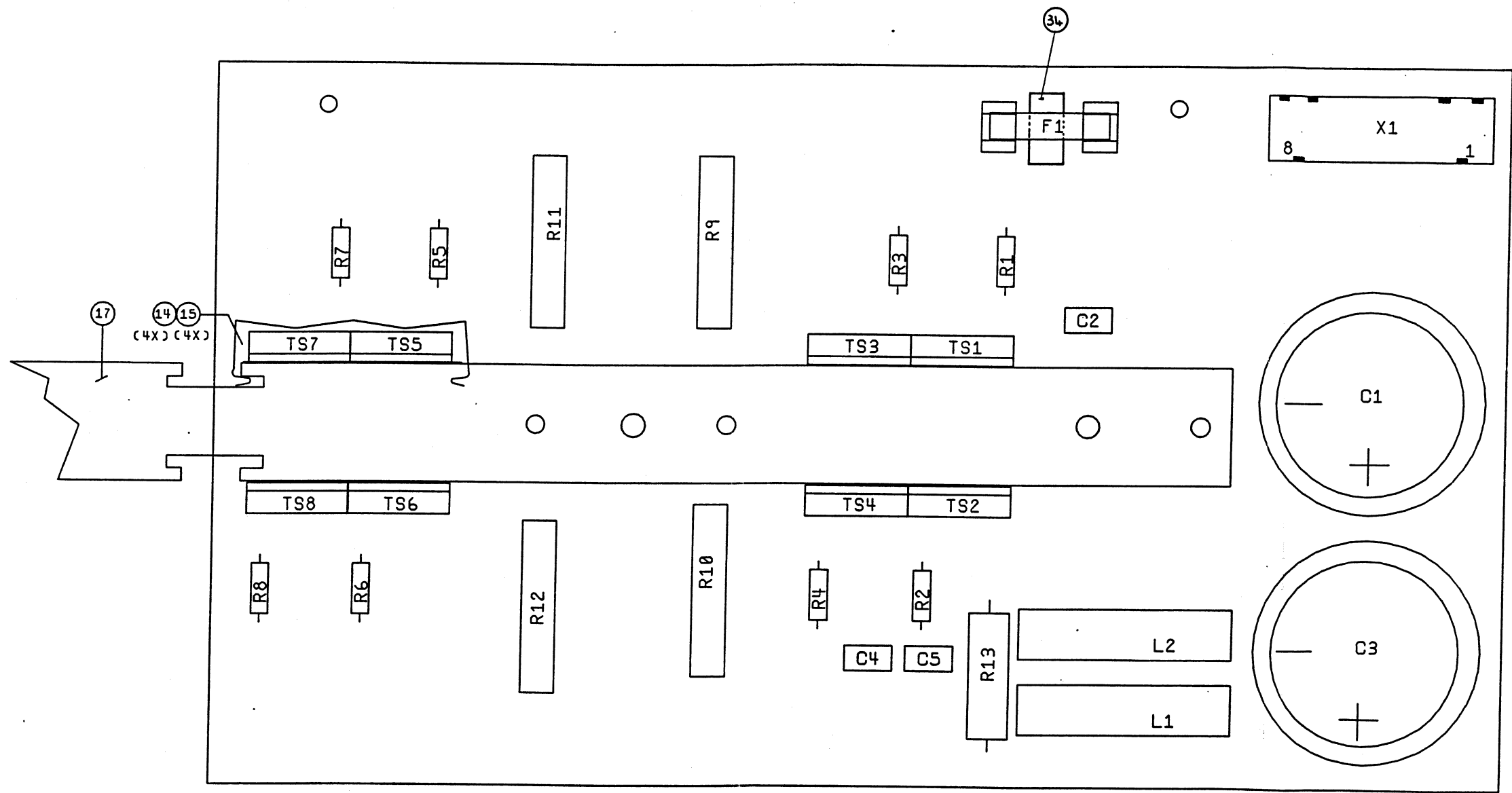
PC BOARD
PRENTPANEEL 3922 101 91550

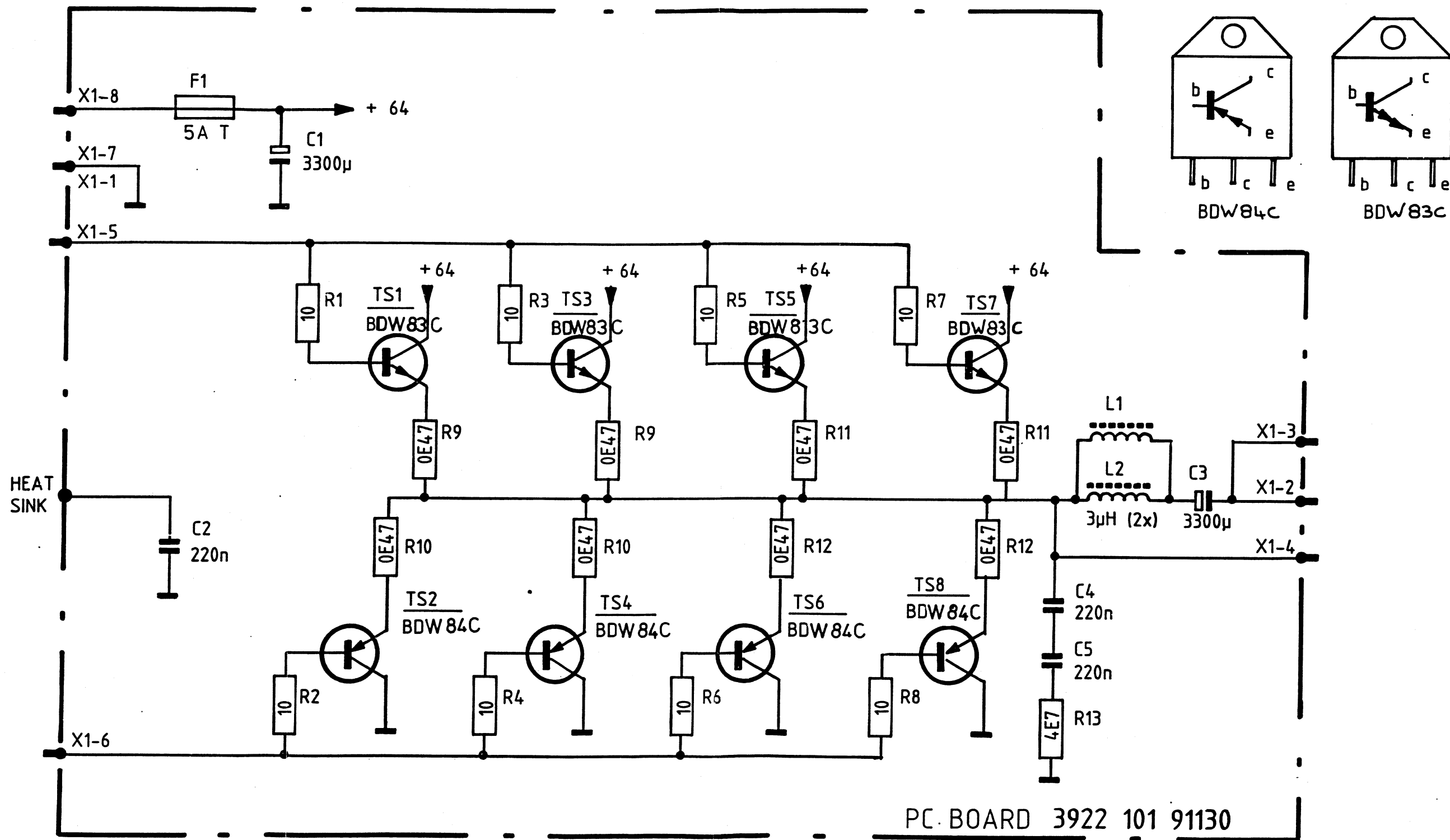
TOP VIEW

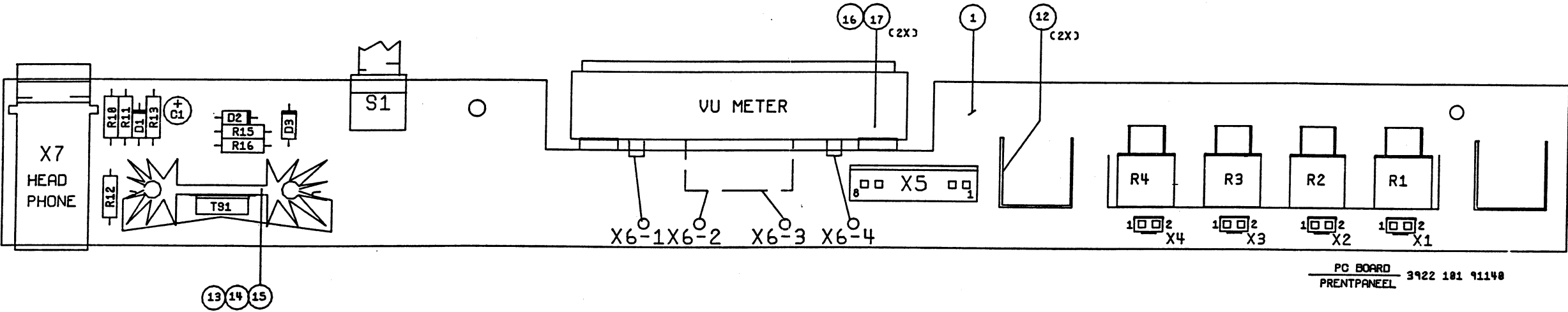


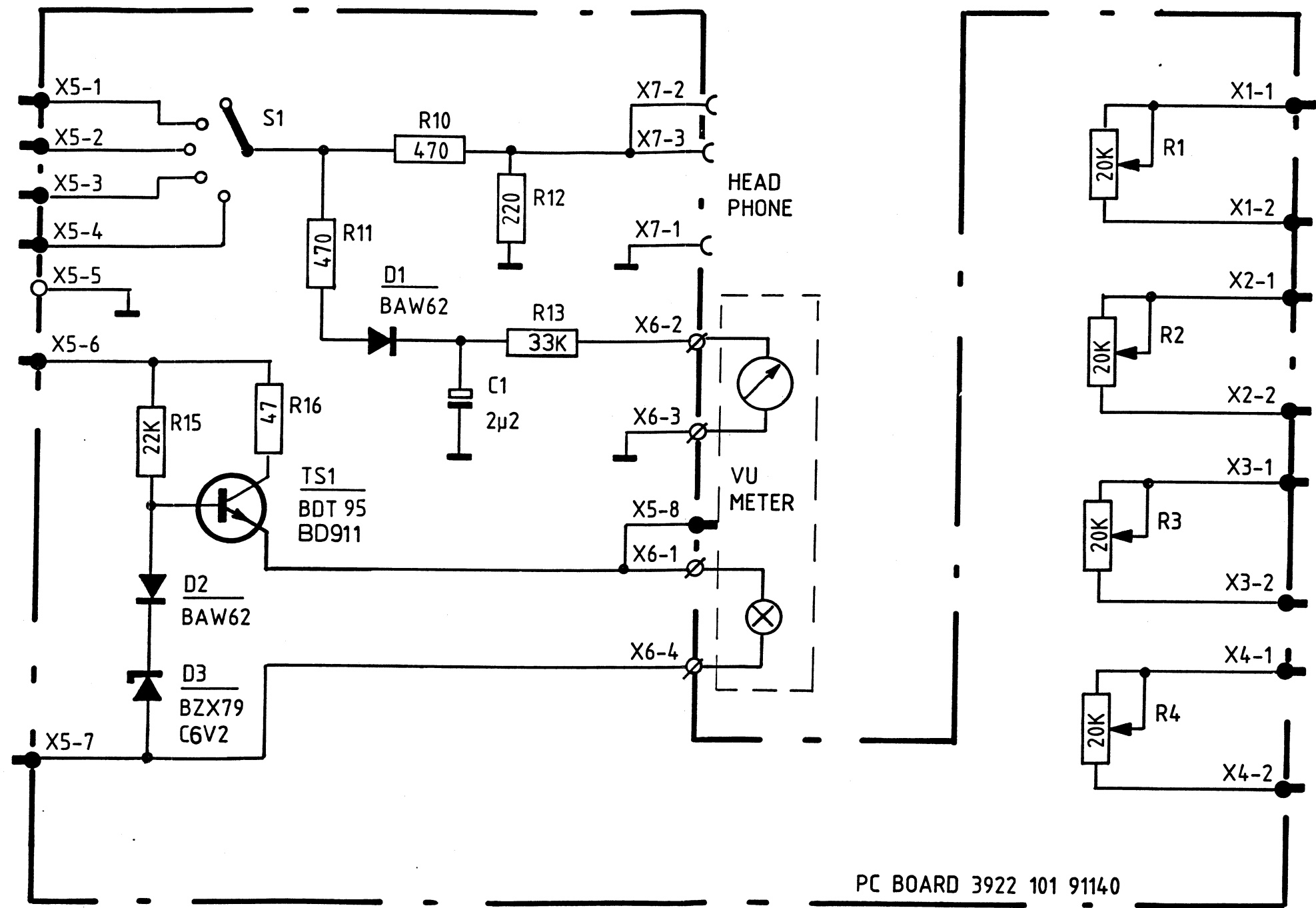
BOTTOM VIEW



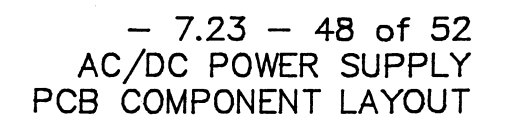


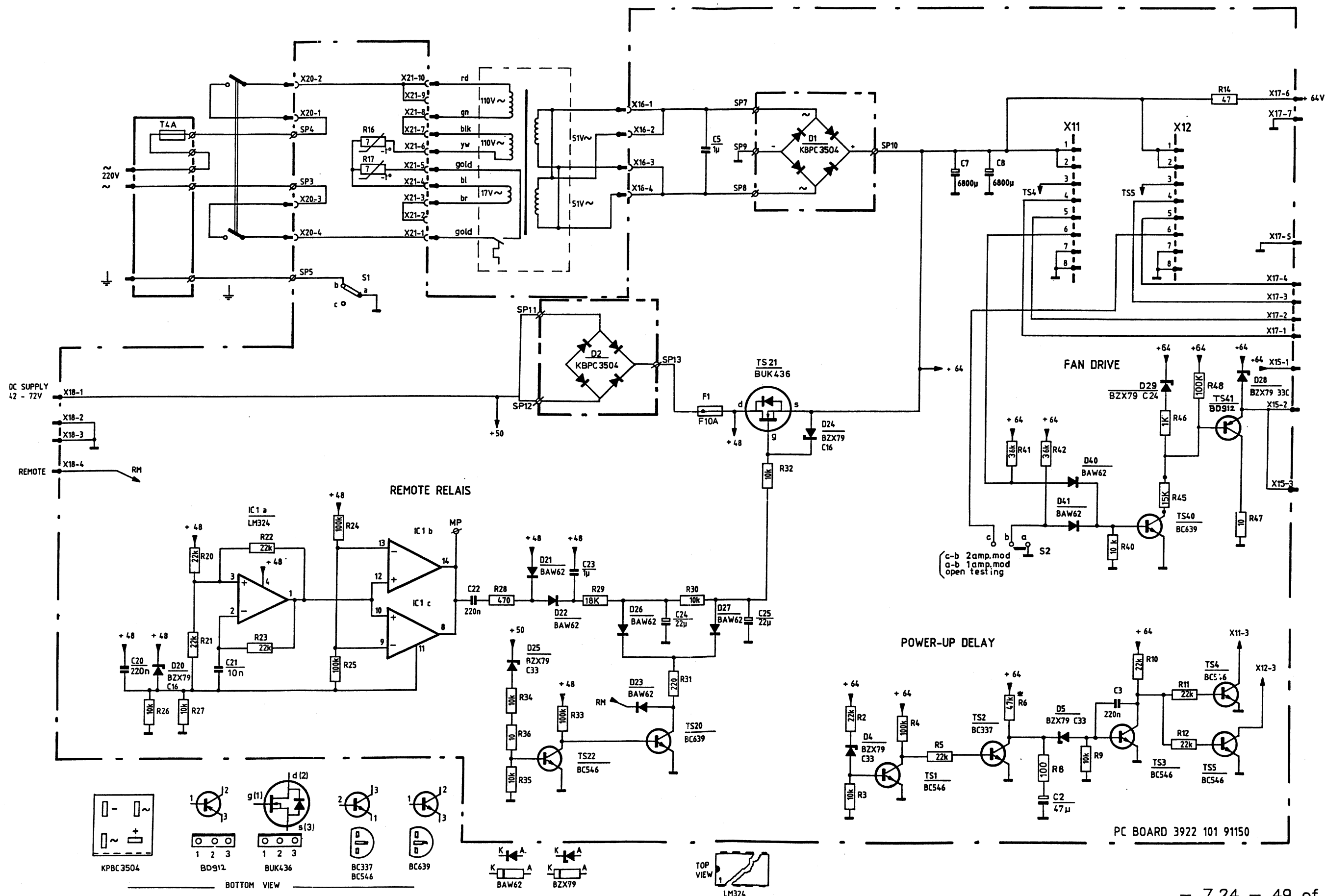


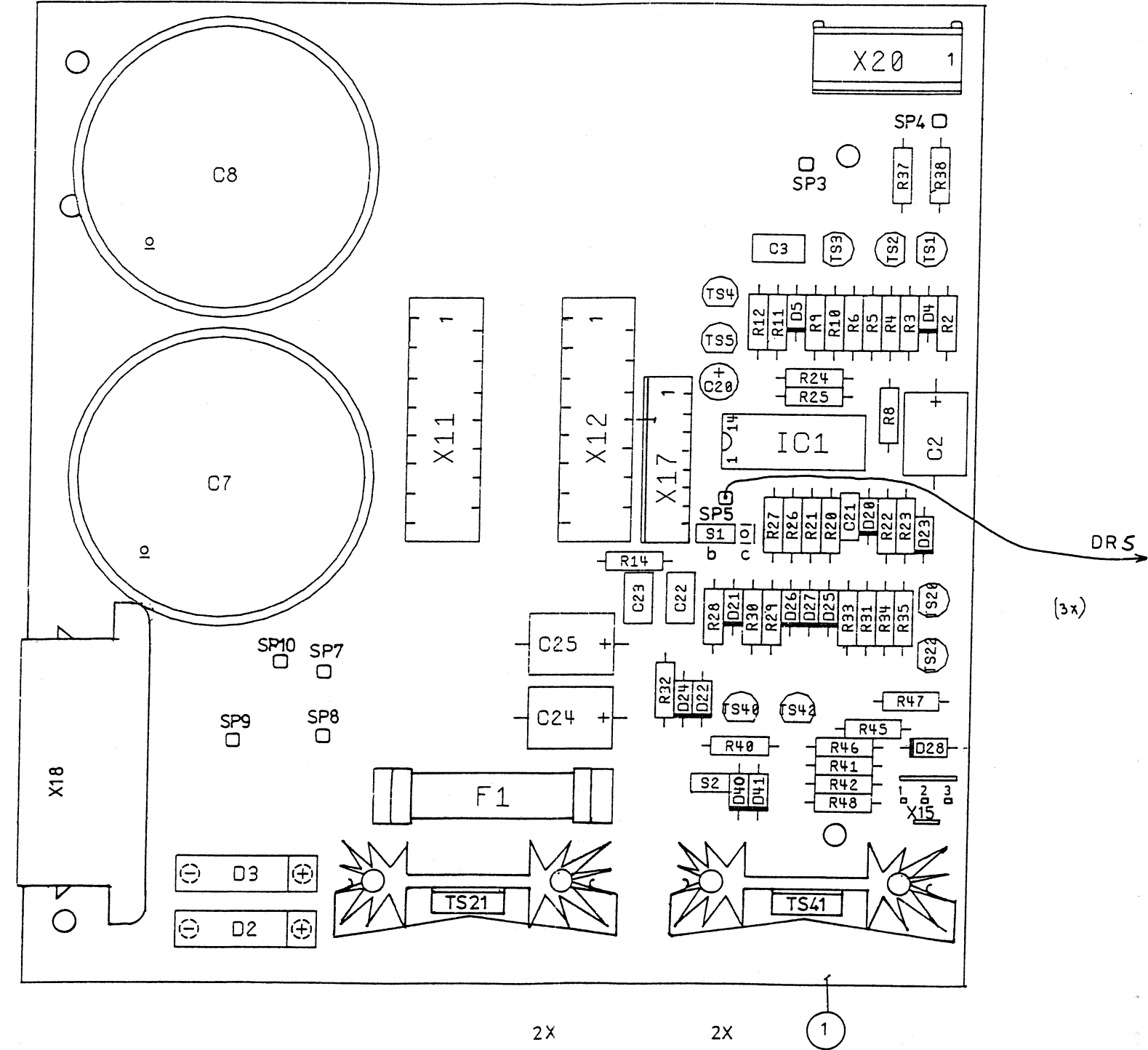




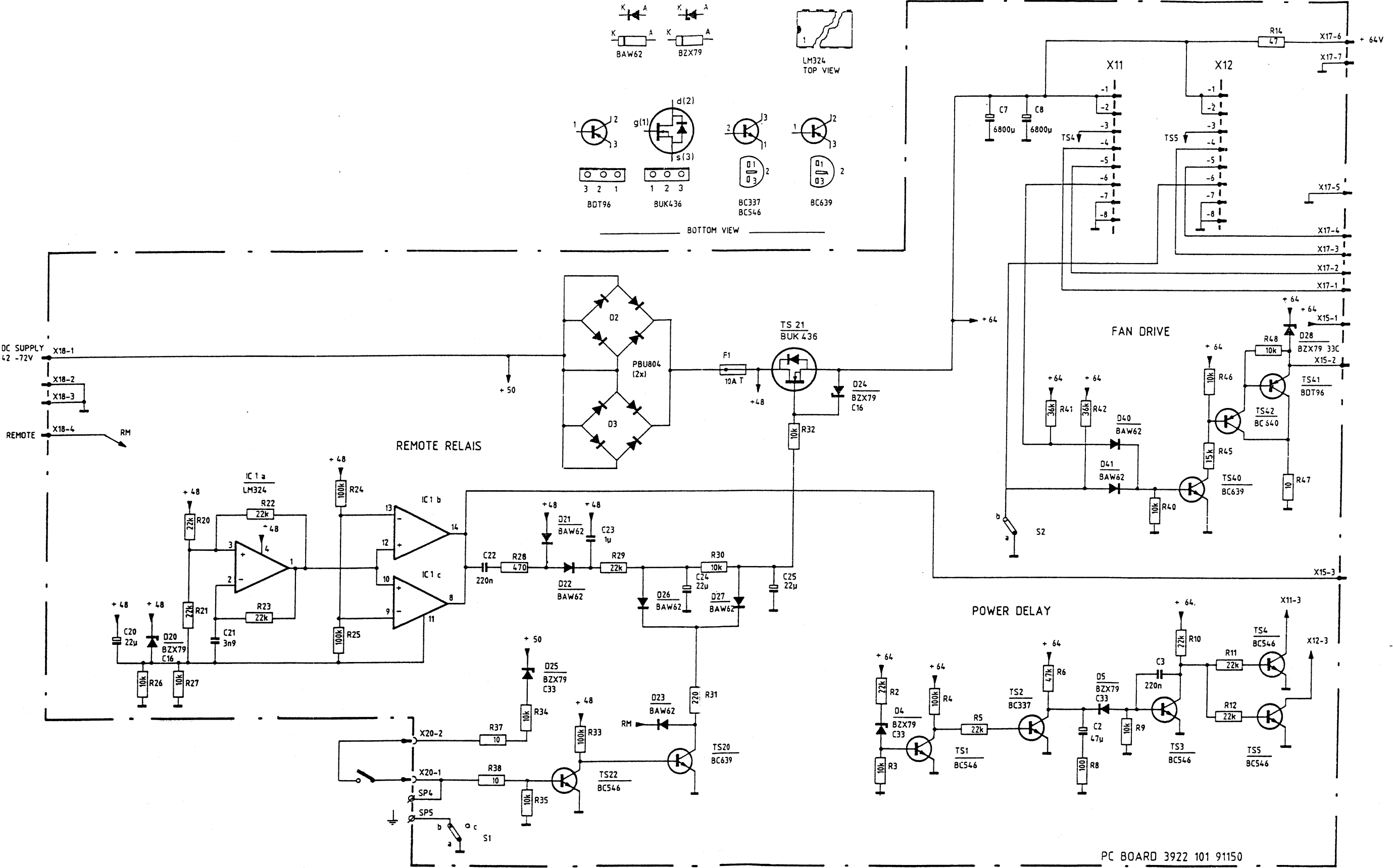
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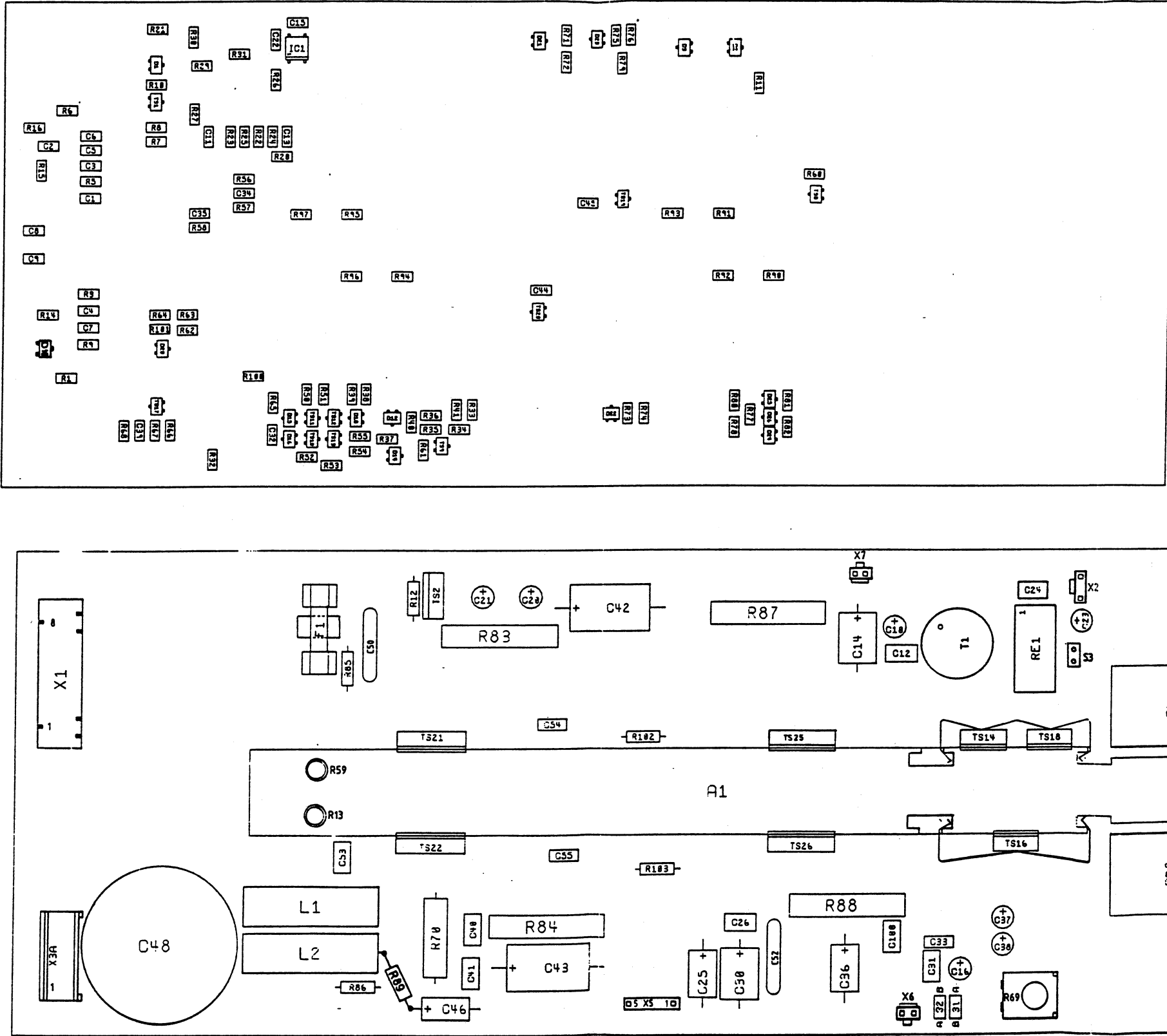






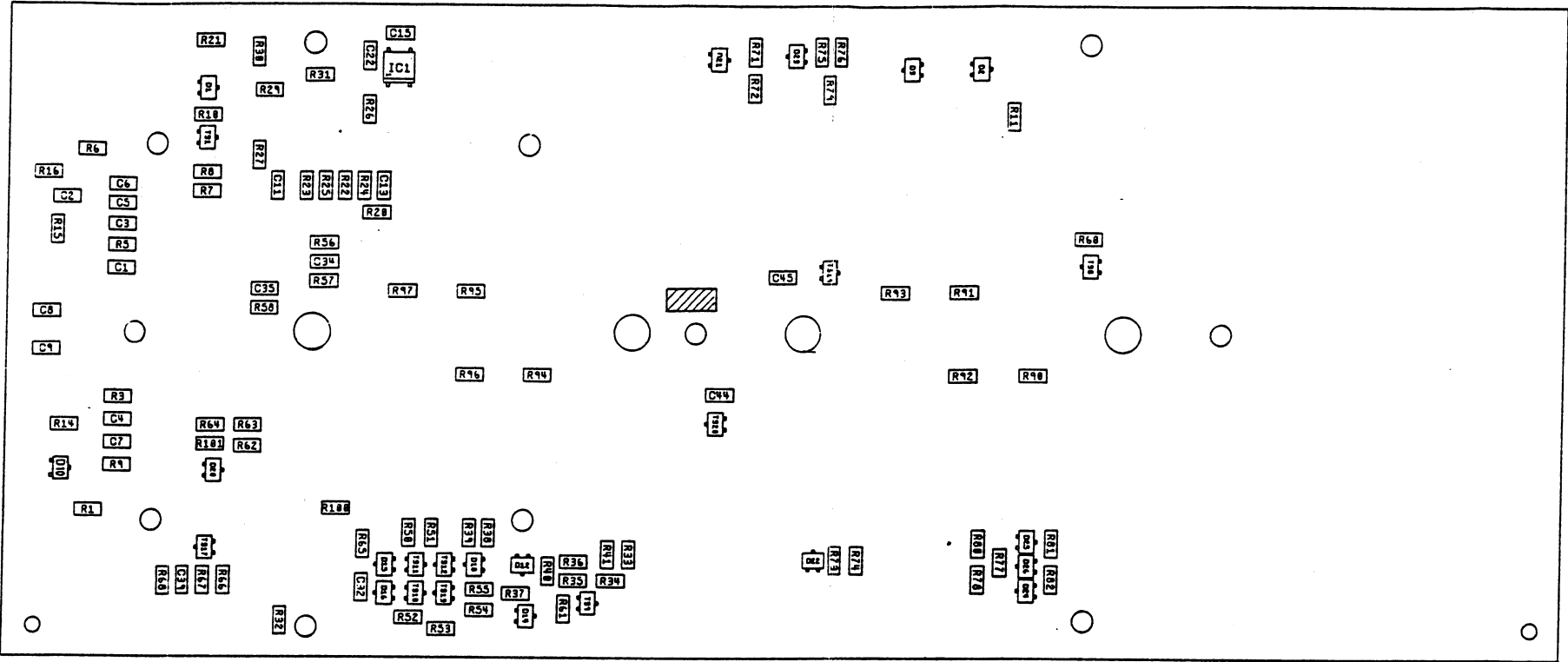
PC BOARD 3922 101 91150





Service Information: 4822 861 05023

FIGURE 1, PAGE 6
PCB COMPONENT LAYOUT 1X100W MODULE



Afschermingschot aansluiting

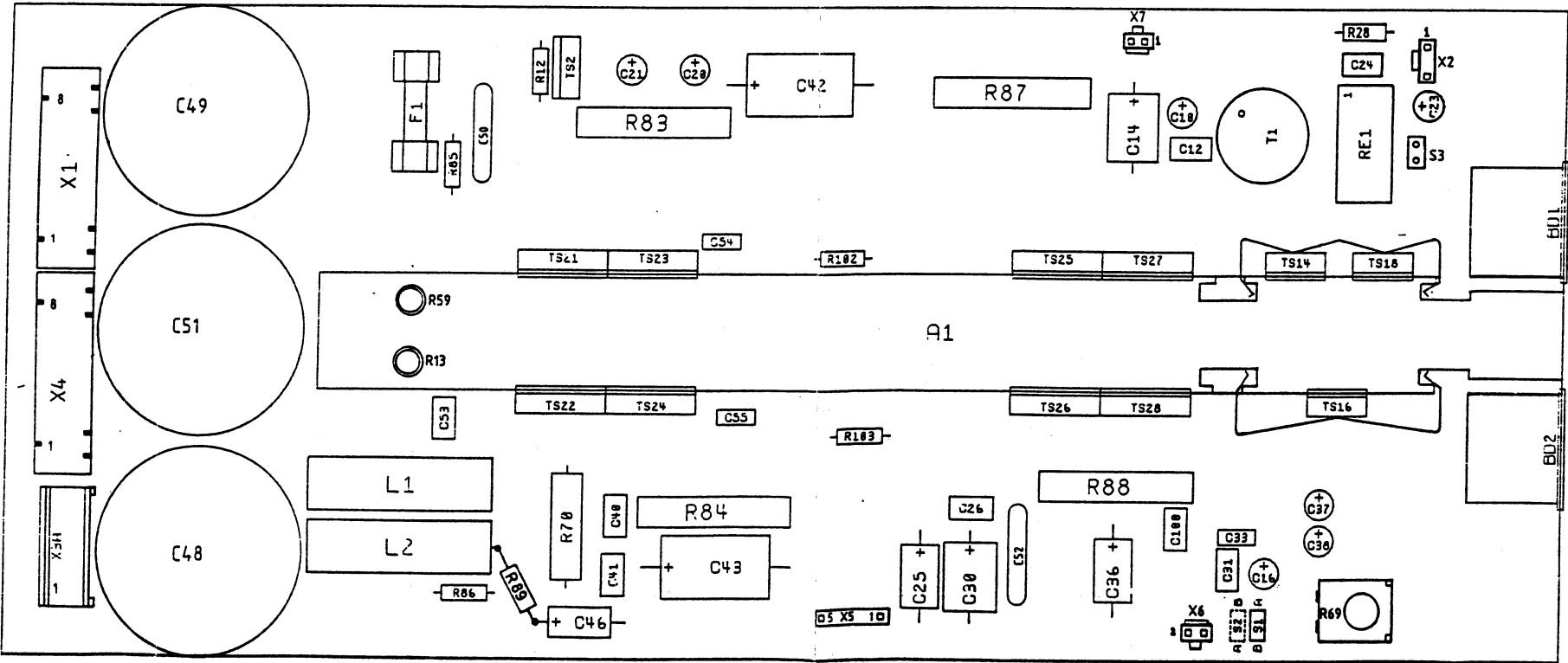
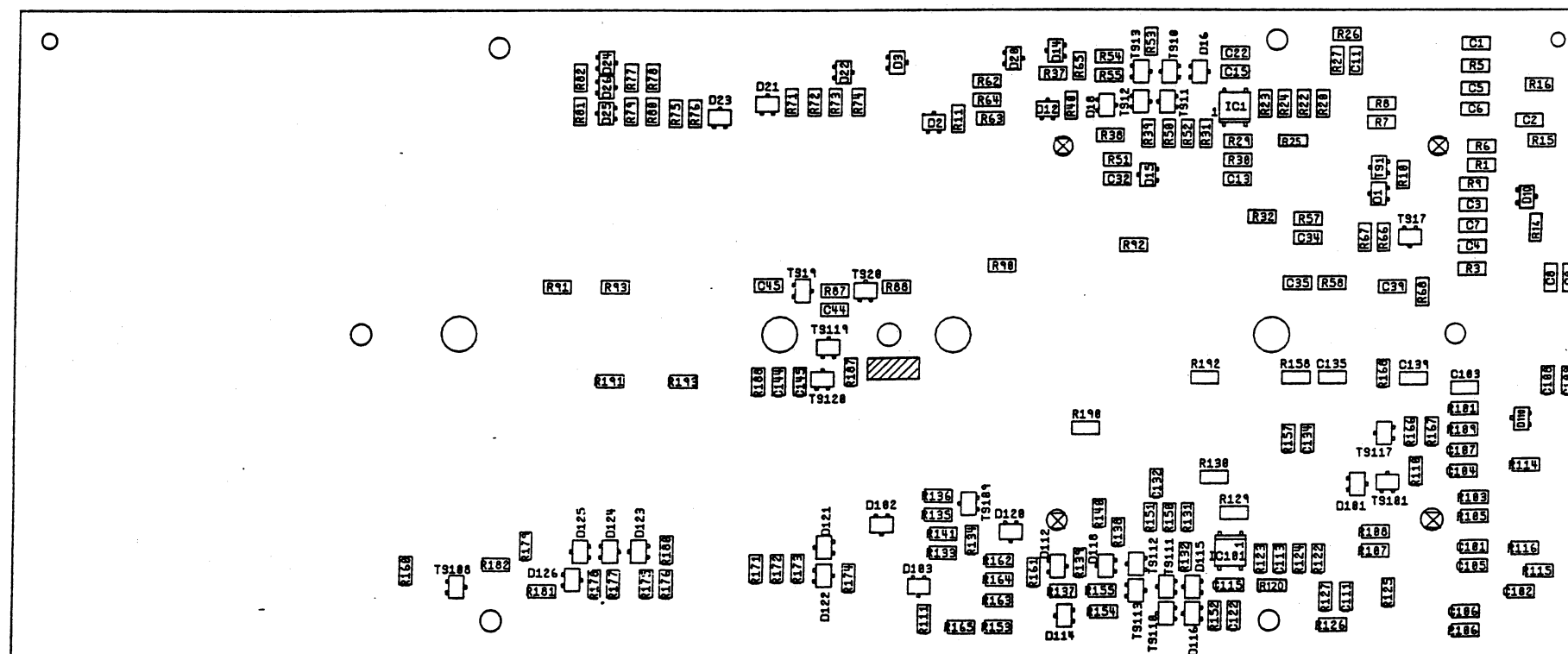
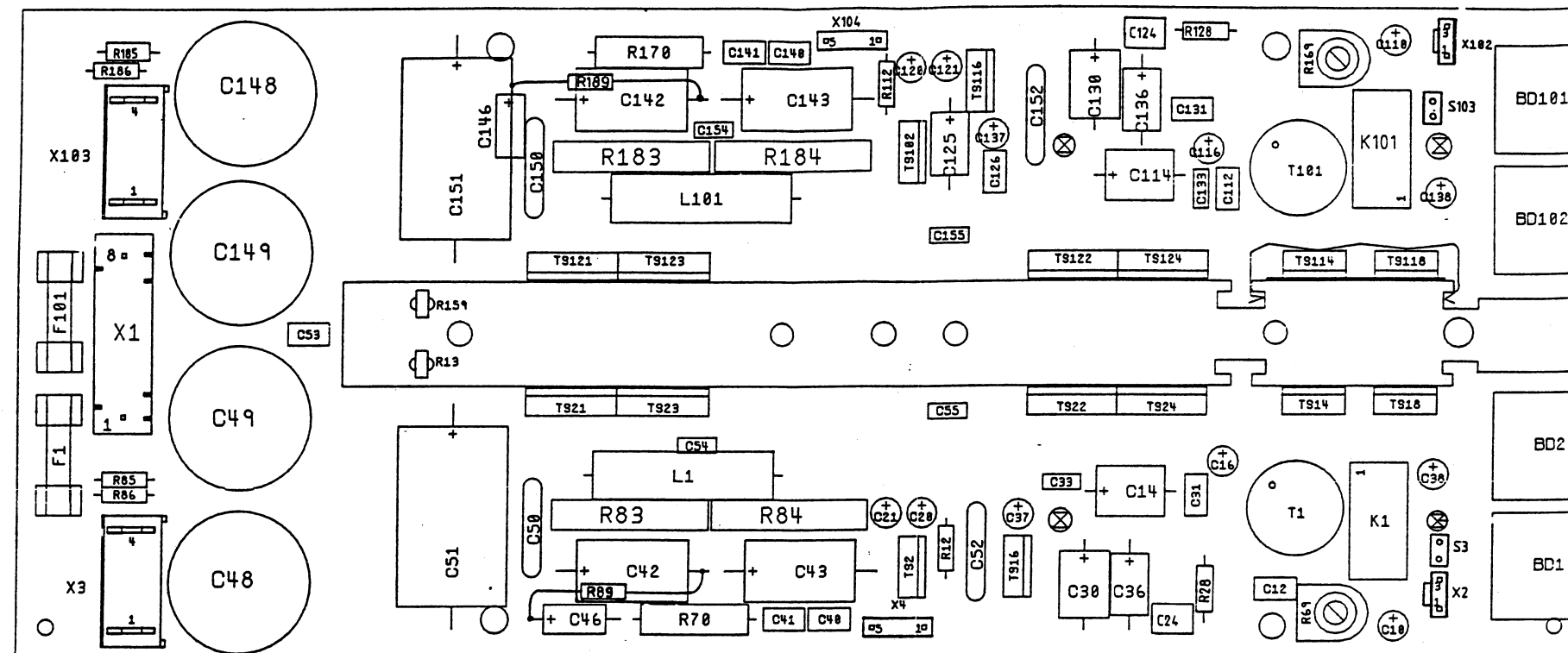


FIGURE 2, PAGE 7
PCB COMPONENT LAYOUT 1X200W MODULE

Service Information: 4822 861 05023



BOTTOM VIEW

Afschermingschot - aansluiting

Service Information: 4822 861 05023

FIGURE 3, PAGE 8

PCB COMPONENT LAYOUT 2X100W MODULE

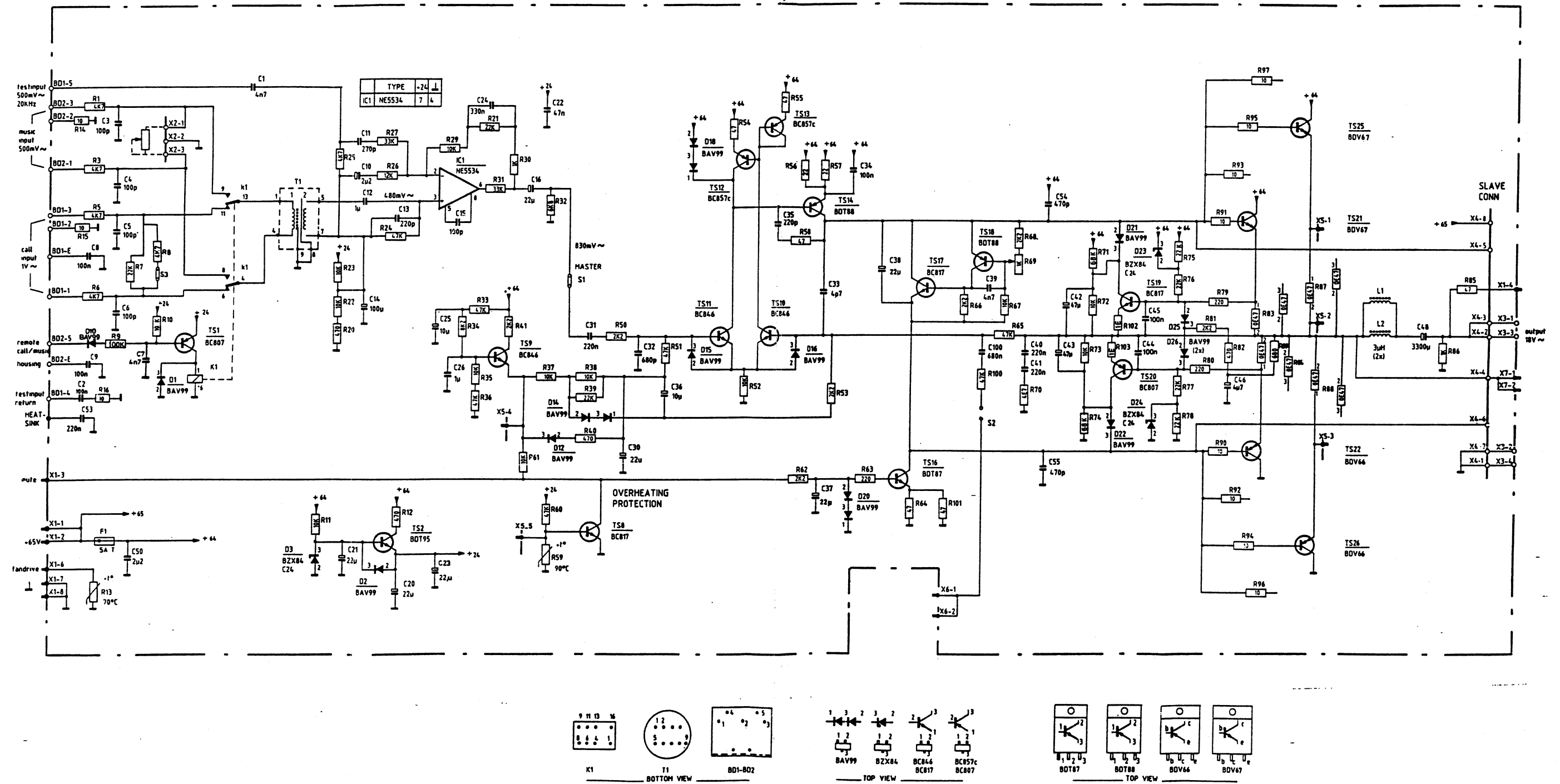
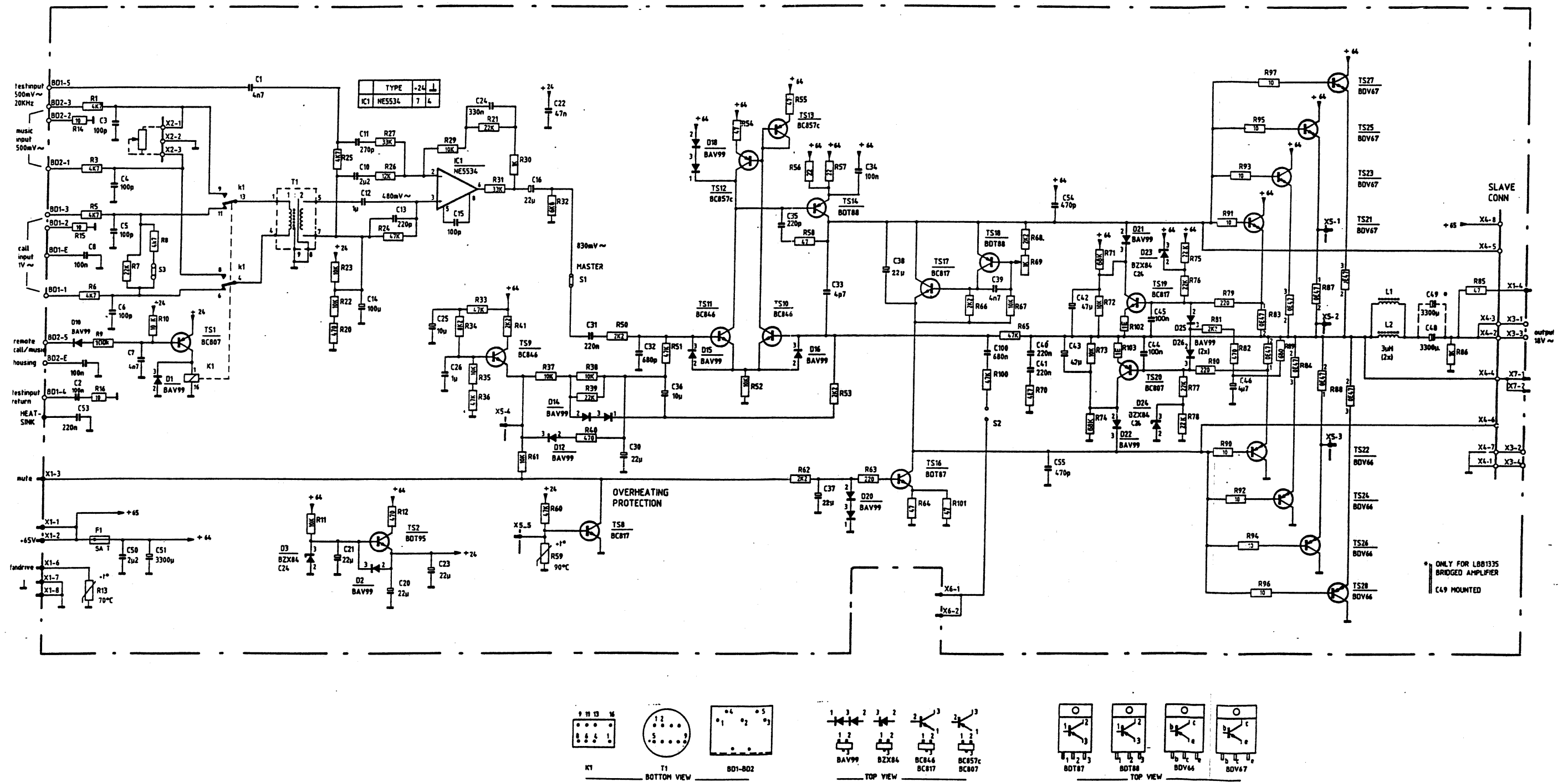


FIGURE 4, PAGE 9

CIRCUIT DIAGRAM 1X100W MODULE

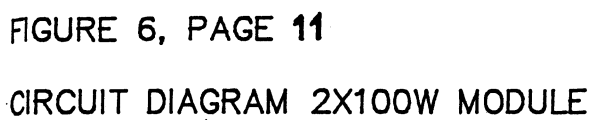
Service Information: 4822 861 05023

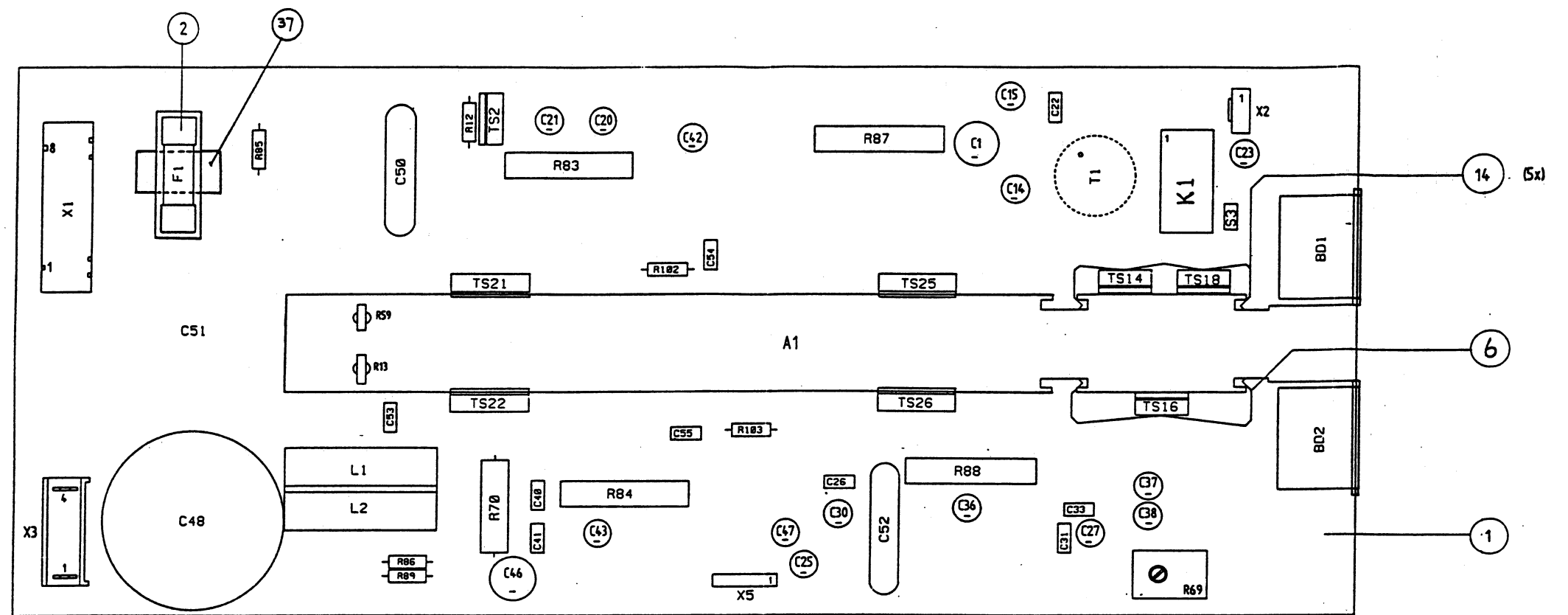


Service Information: 4822 861 05023

FIGURE 5, PAGE 10

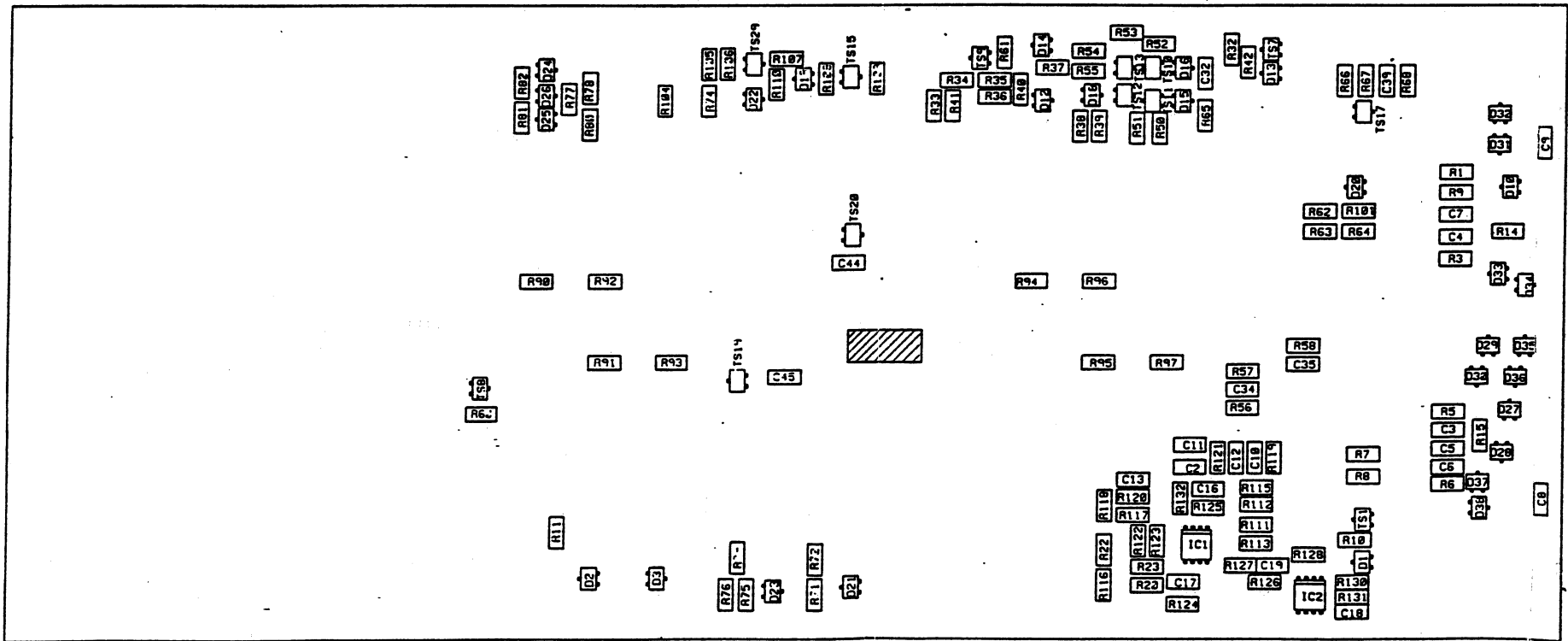
CIRCUIT DIAGRAM 1X200W MODULE





TOP VIEW

3922 101 91120 PRENTPANEEL
PRINTED BOARD



BOTTOM VIEW

Service Information: 4822 861 05034

FIGURE 1, PAGE 8
Version B
PCB COMPONENT LAYOUT 1 X 100W MODULE

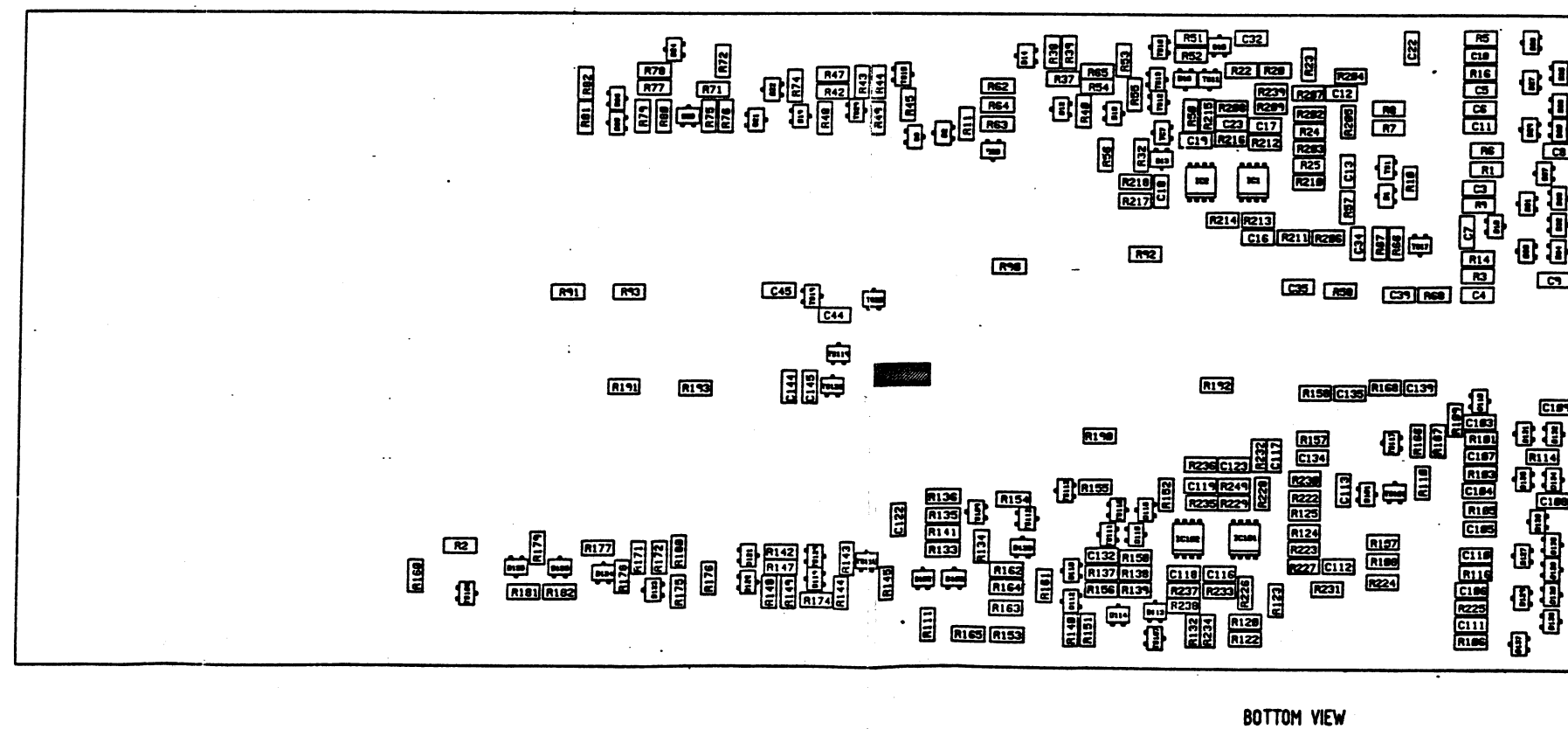
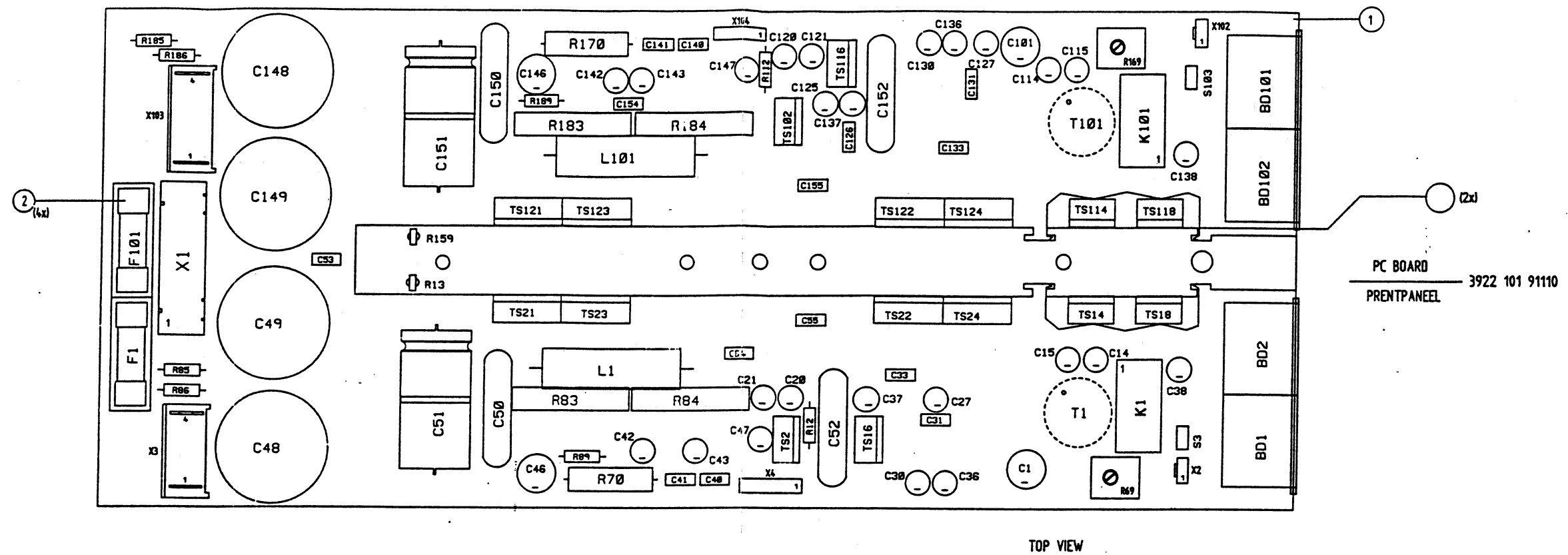
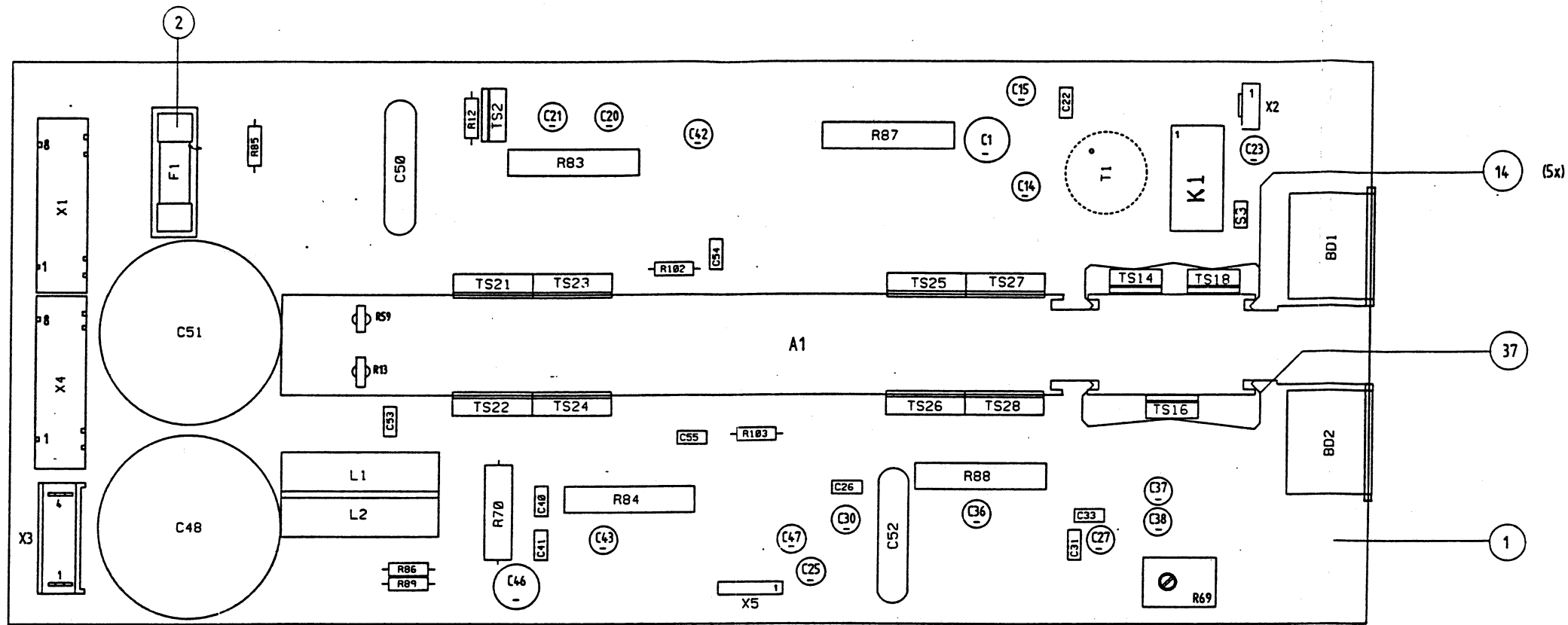


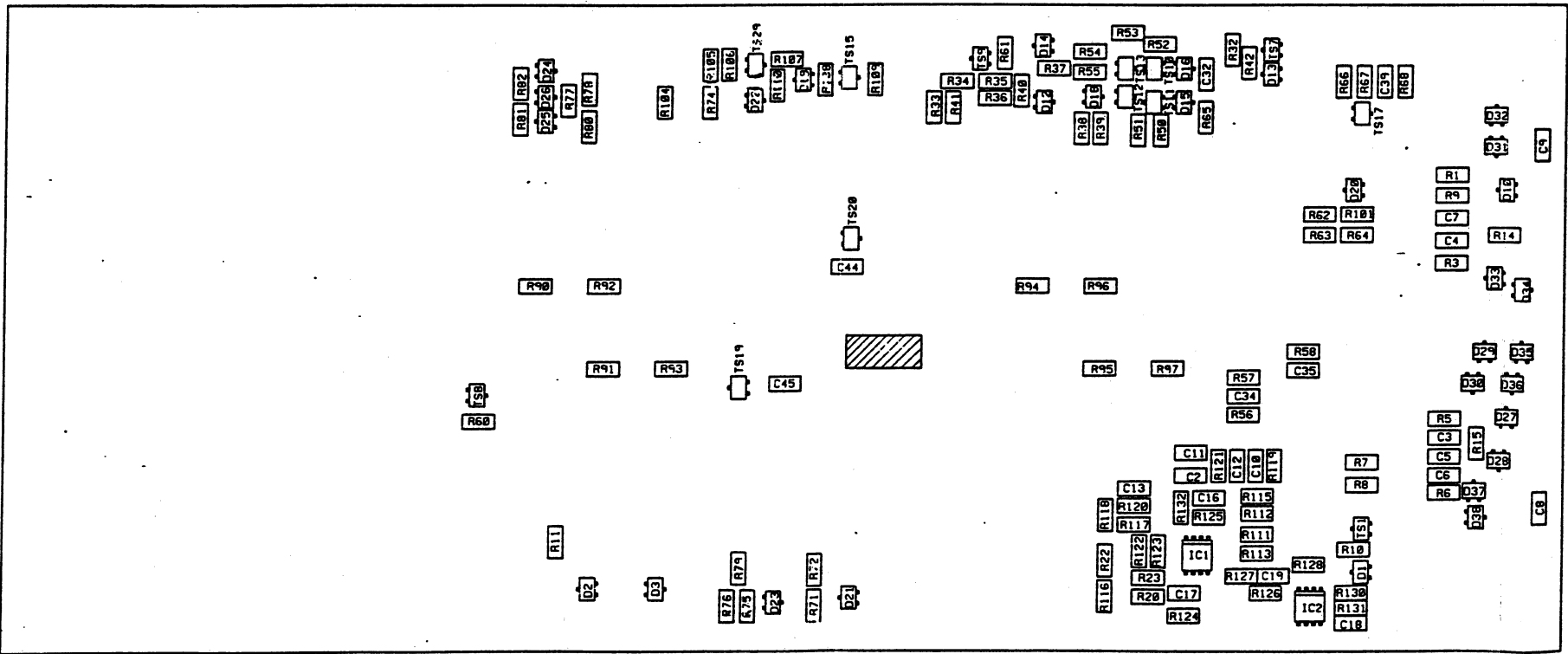
FIGURE 2, PAGE 9
Version B
PCB COMPONENT LAYOUT 2 X 100W MODULE

Service Information: 4822 861 05034



TOP VIEW

3922 101 91120 PRENTPANEL
PRINTED BOARD



BOTTOM VIEW

Service Information: 4822 861 05034

FIGURE 3, PAGE 10
Version B
PCB COMPONENT LAYOUT 1 X 200W MODULE

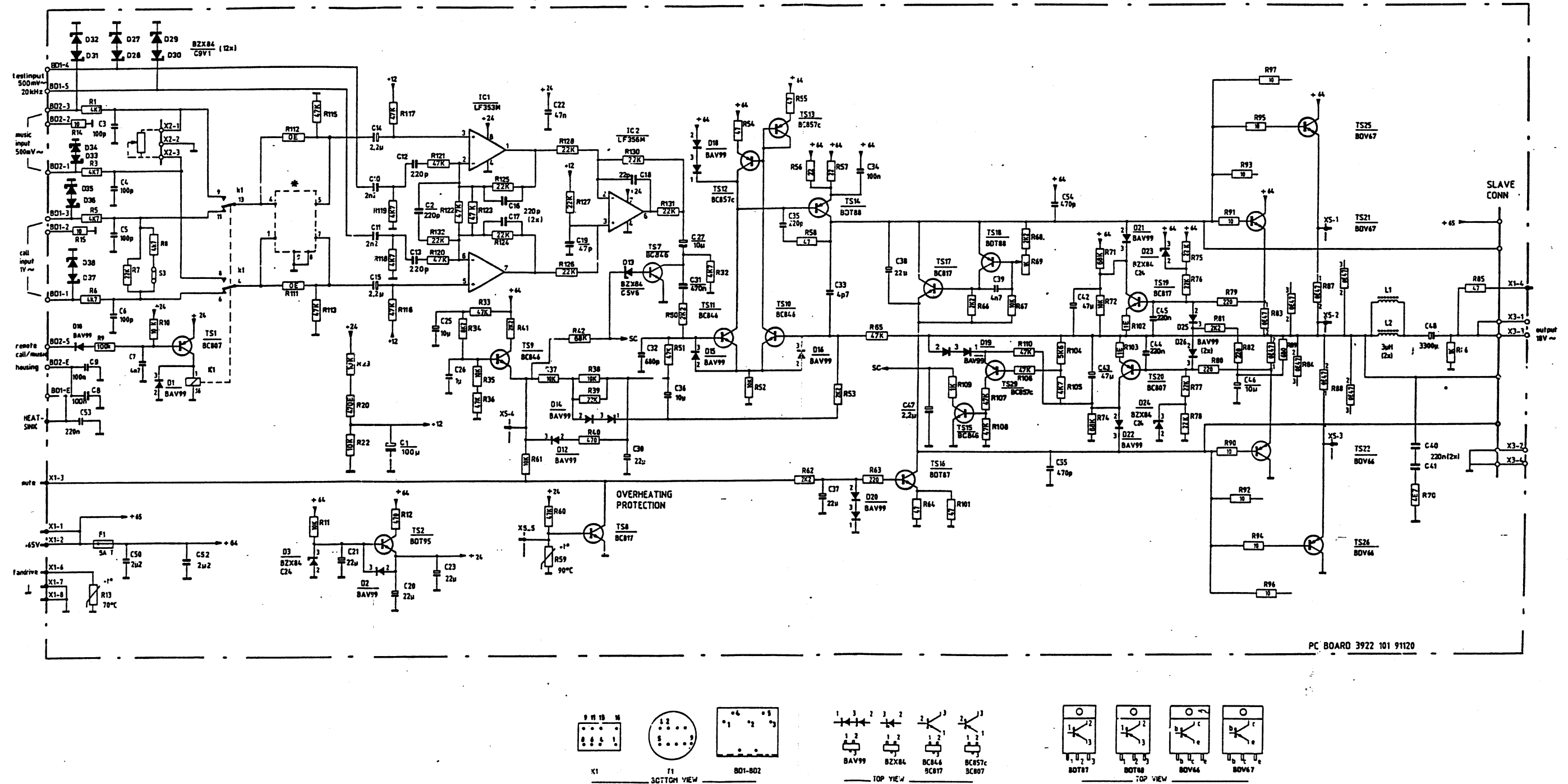
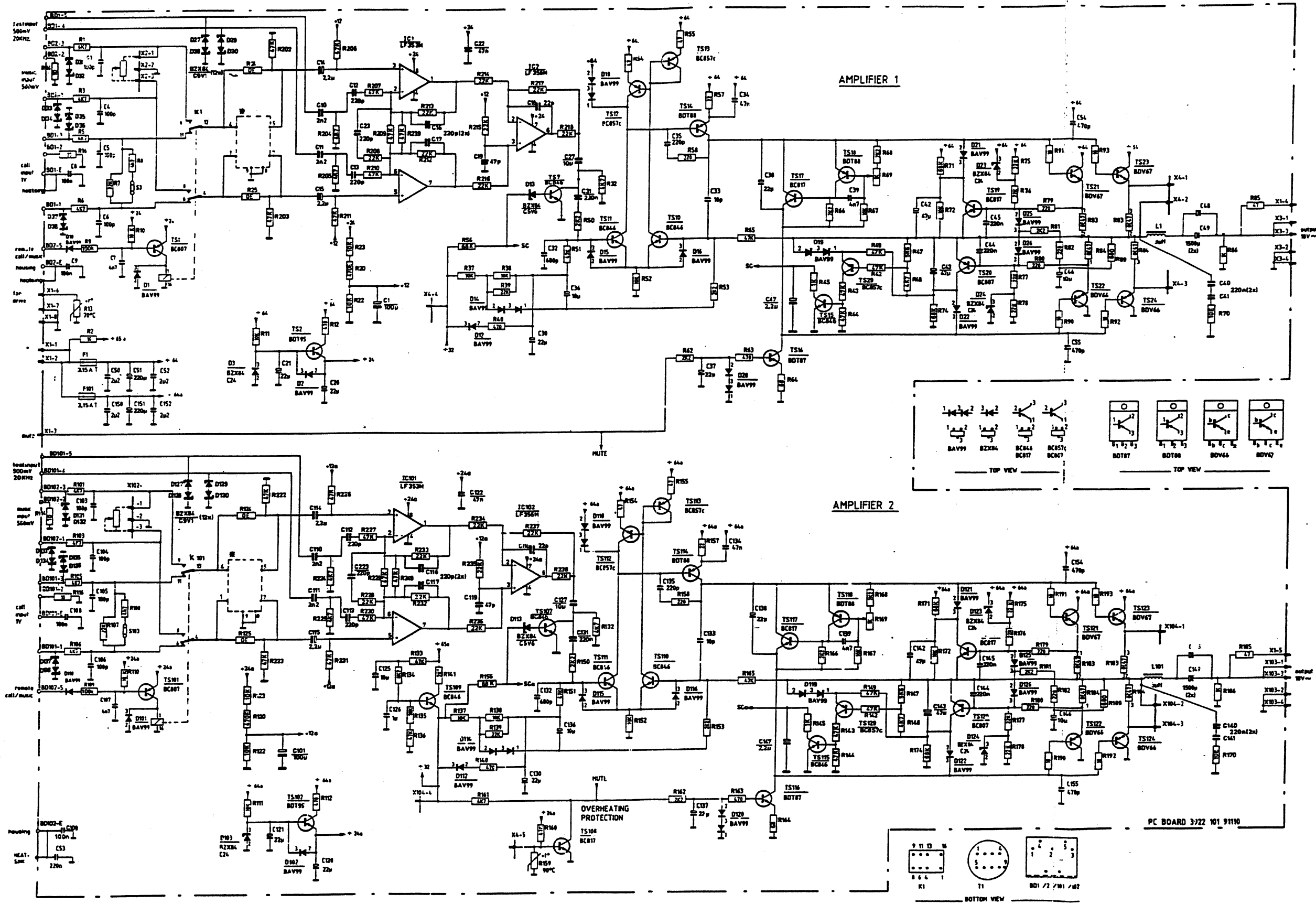


FIGURE 4, PAGE 11
Version B
CIRCUIT DIAGRAM 1 X 100W MODULE

Service Information: 4822 861 05034



Service Information: 4822 861 05034

FIGURE 5, PAGE 12
Version B
CIRCUIT DIAGRAM 2 X 100W MODULE

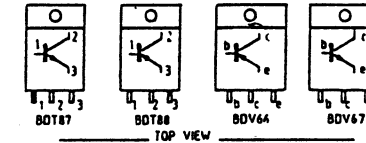
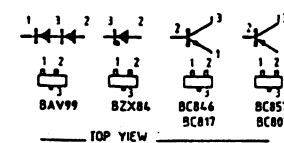
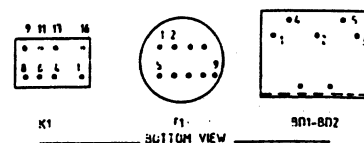
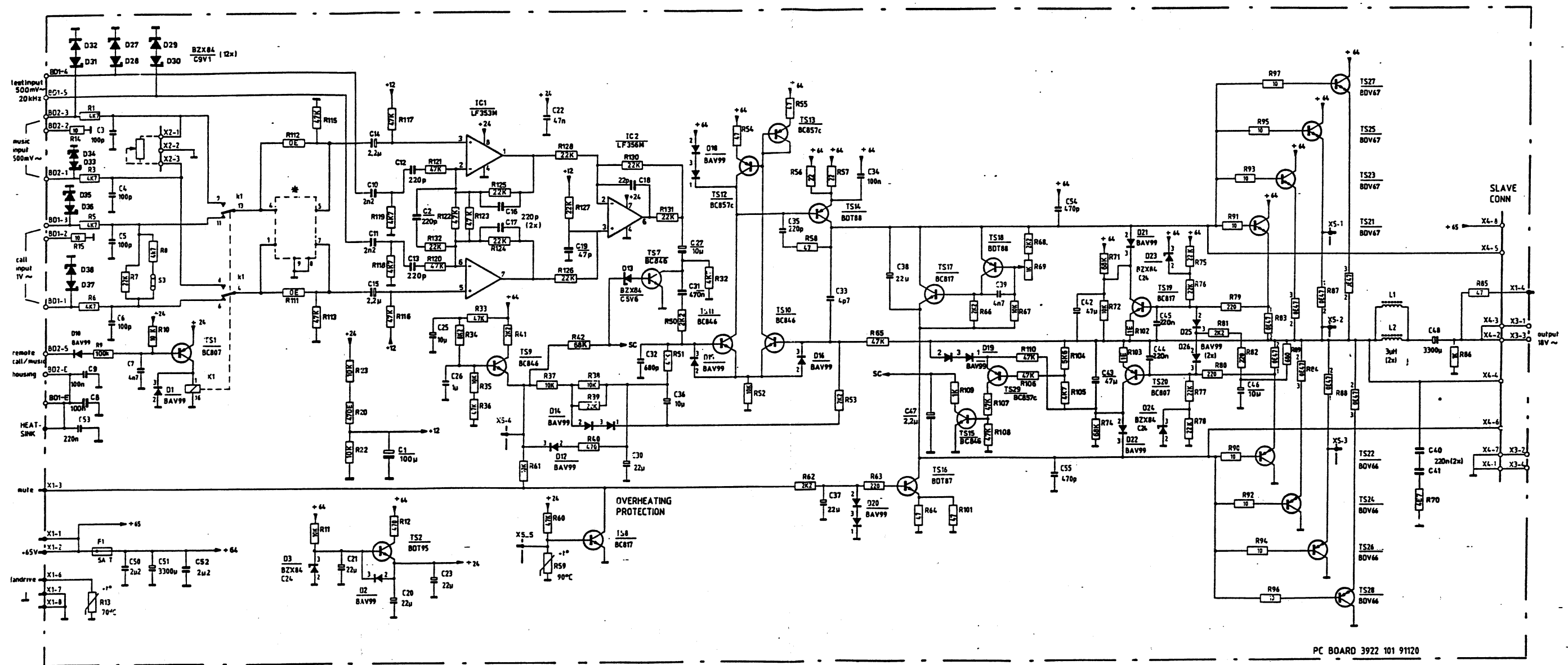
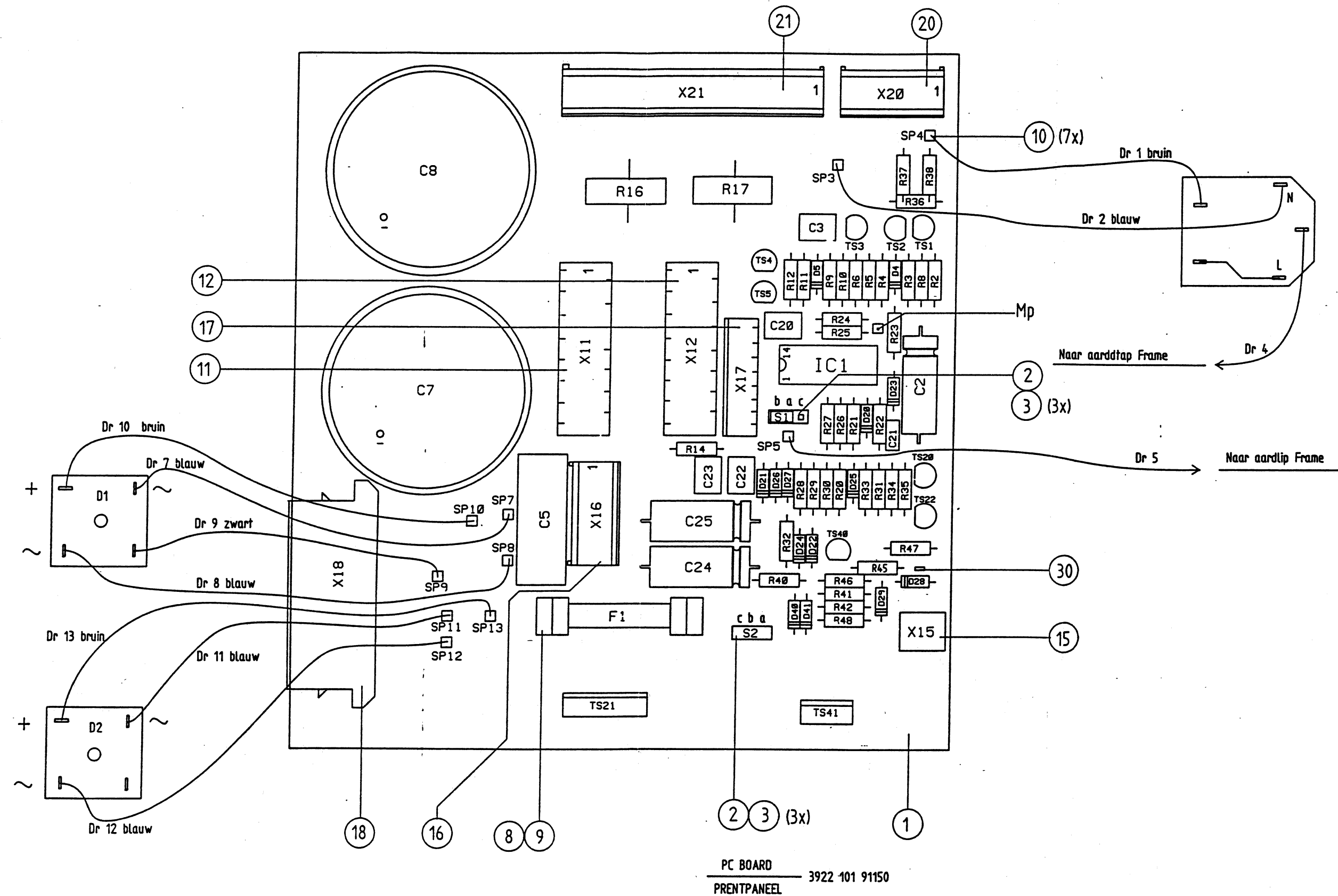


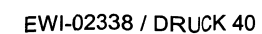
FIGURE 6, PAGE 13
Version B
CIRCUIT DIAGRAM 1 X 200W MODULE

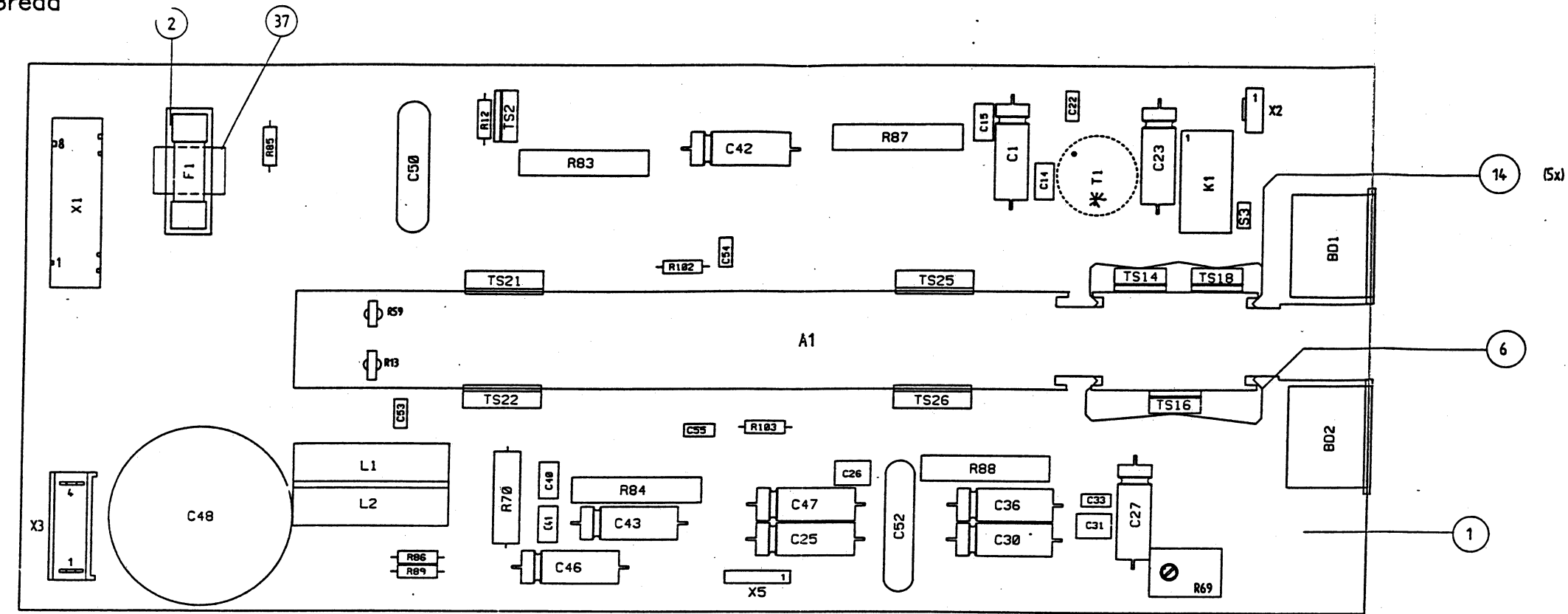
Service Information: 4822 861 05034



Service Information: 4822 861 05034

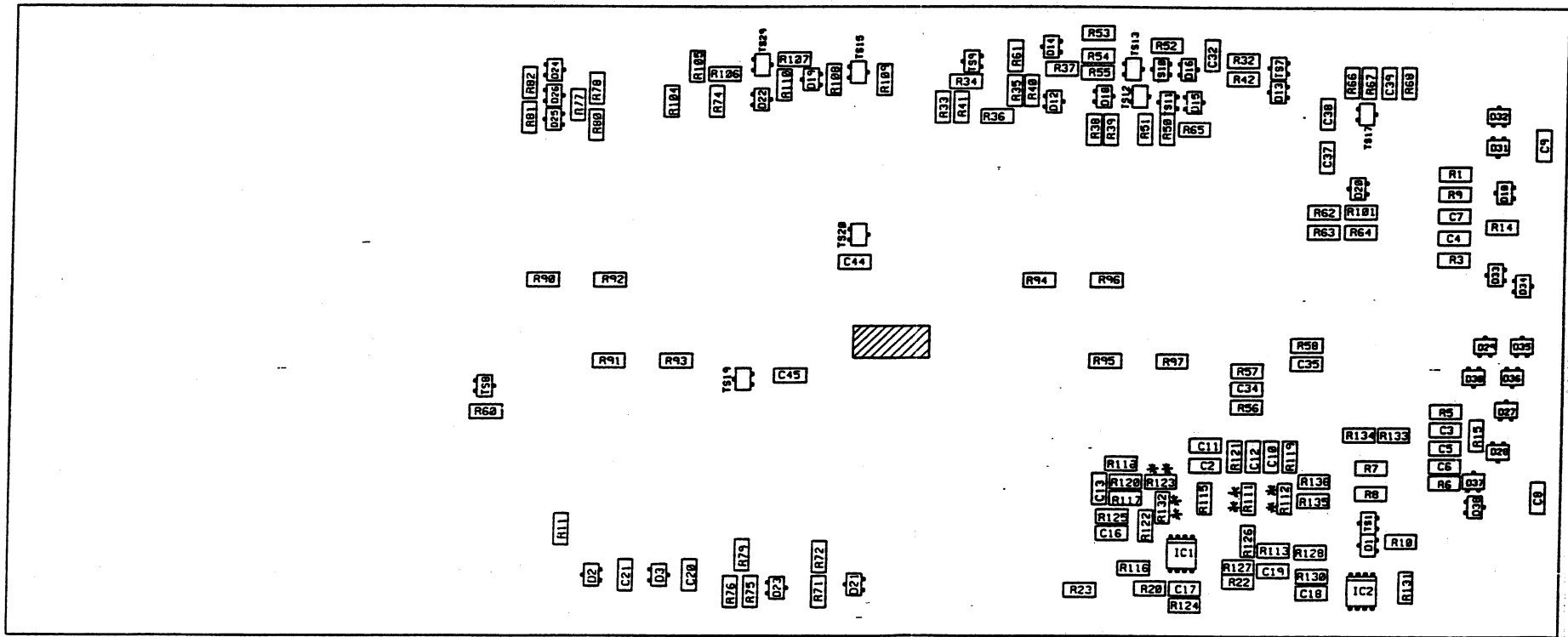
FIGURE 7, PAGE 14
PCB COMPONENT LAYOUT POWER SUPPLY MODULE (VERSION C, D)





TOP VIEW

3922 101 91120 PRENTPANEEL
PRINTED BOARD

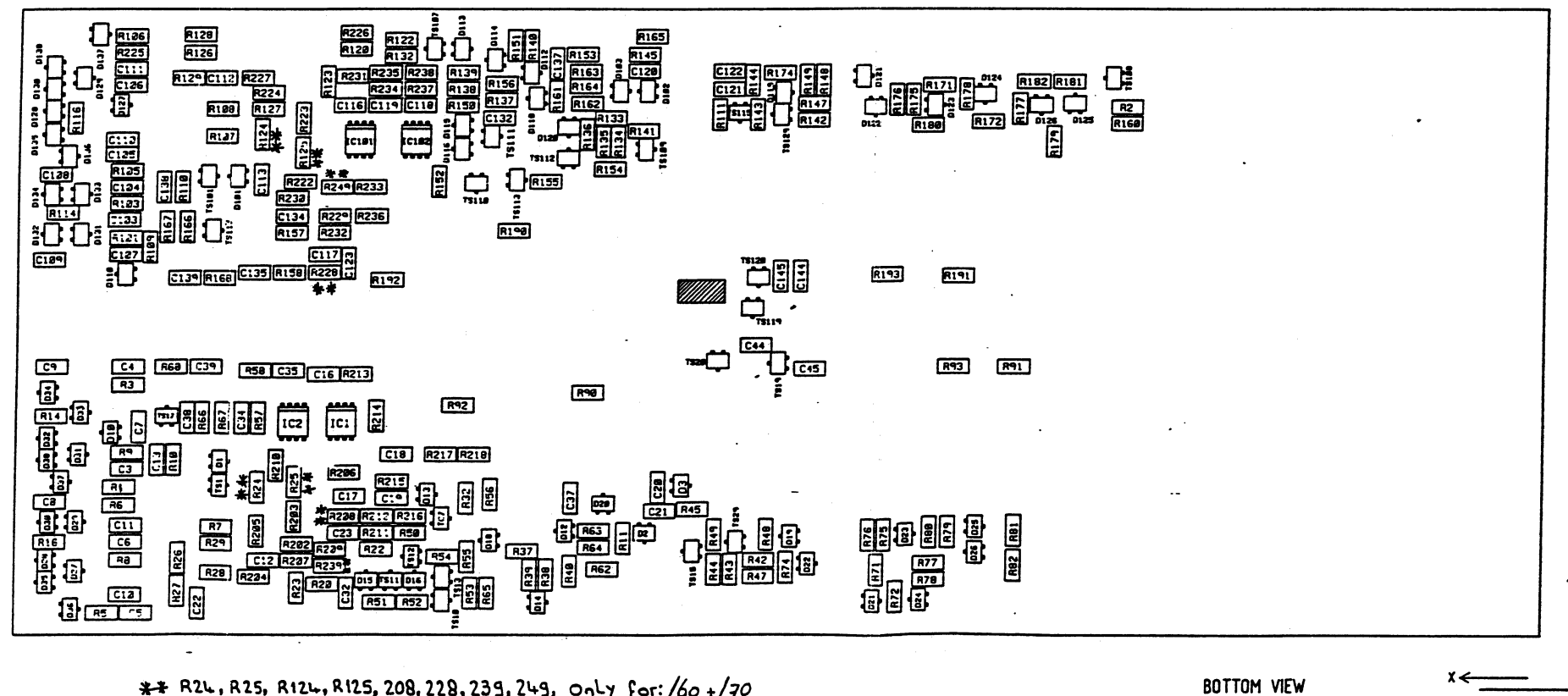
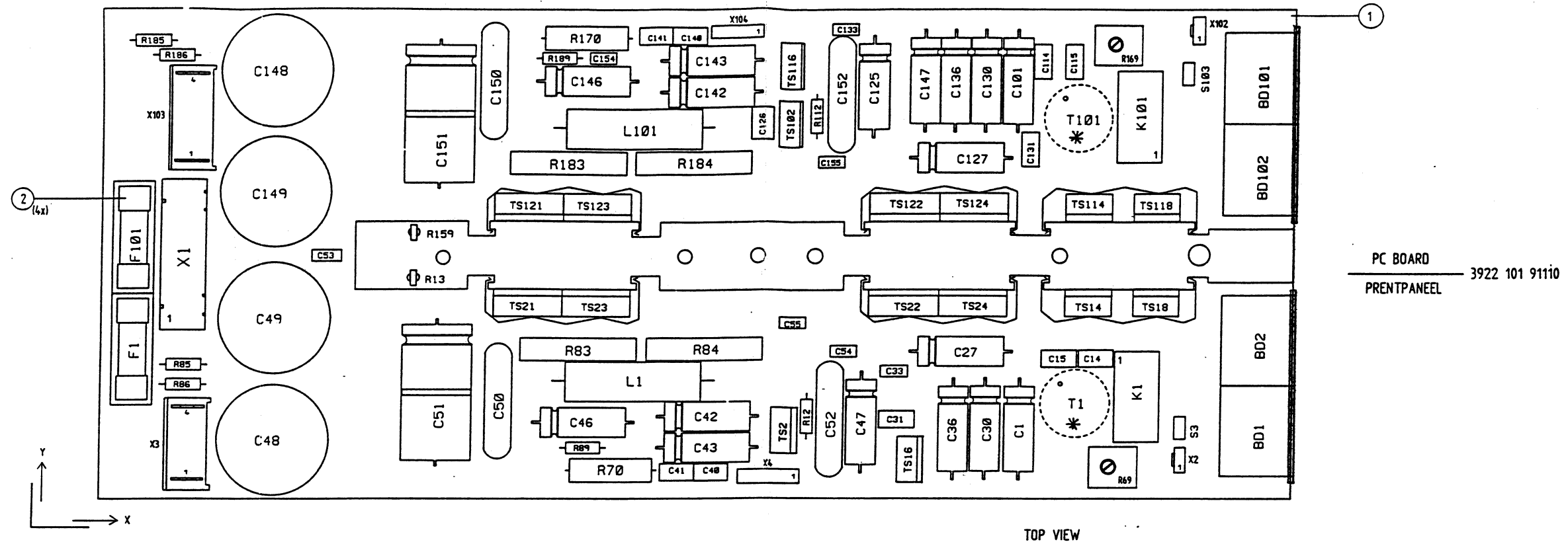


BOTTOM VIEW

** R111, R112, R123, R132, Only for: /60+/70
* T1, Only for: /30+/40

Service Information: 4822 861 05034

FIGURE 9, PAGE 16
version C, D
PCB COMPONENT LAYOUT 1 X 100W MODULE



** R24, R25, R124, R125, 208, 228, 239, 249, only for: /60+/70
 * T1, T101, only for: /30+/40

FIGURE 10, PAGE 17
 Version C, D
 PCB COMPONENT LAYOUT 2 X 100W MODULE

Service Information: 4822 861 05034

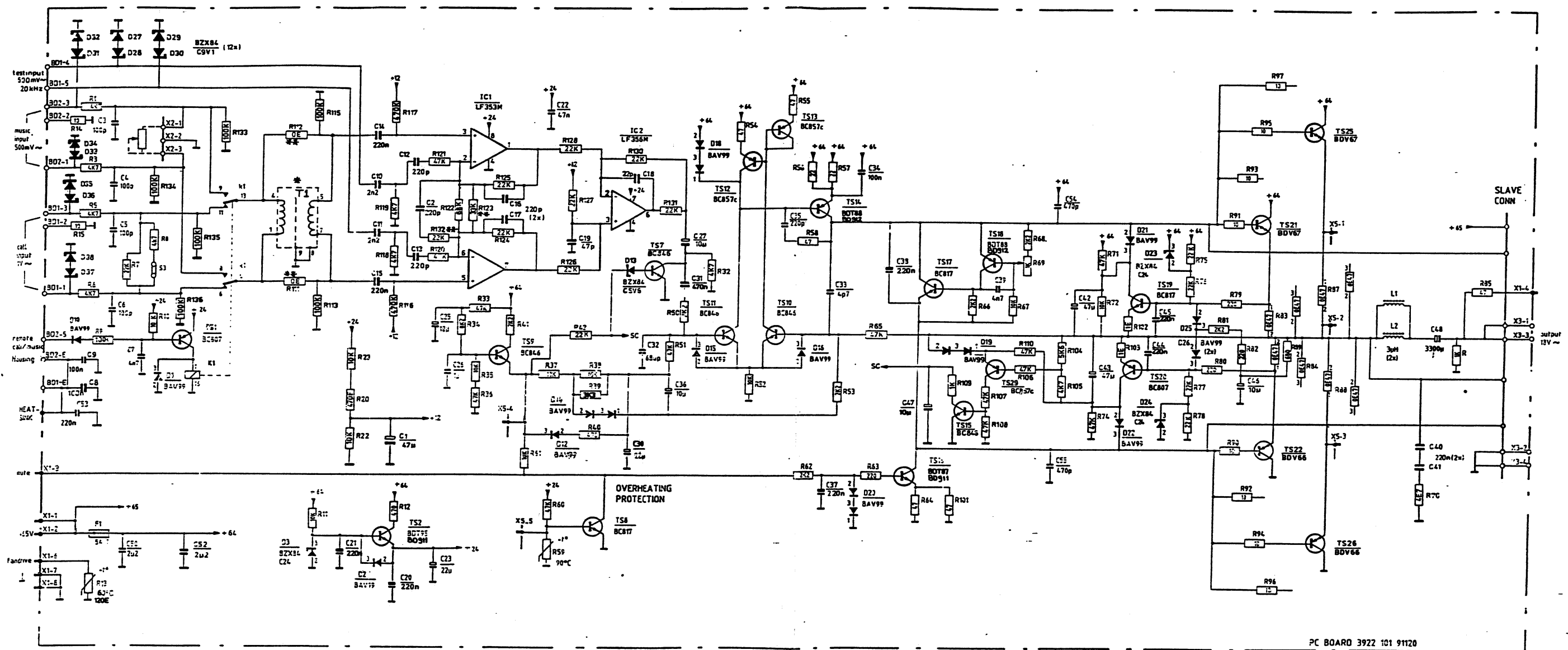


3922 101 91120 PRENTPANEEL
PRINTED BOARD



Service Information: 4822 861 05034

FIGURE 11, PAGE 18
Version C, D
PCB COMPONENT LAYOUT 1 X 200W MODULE



* R111, R112, R123, R132. Only for: /60+/70
 * T1. Only for: /30+/70

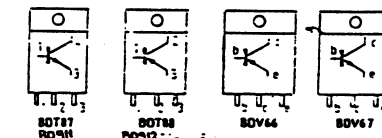
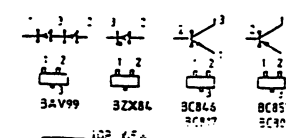
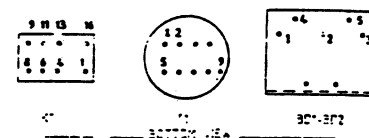
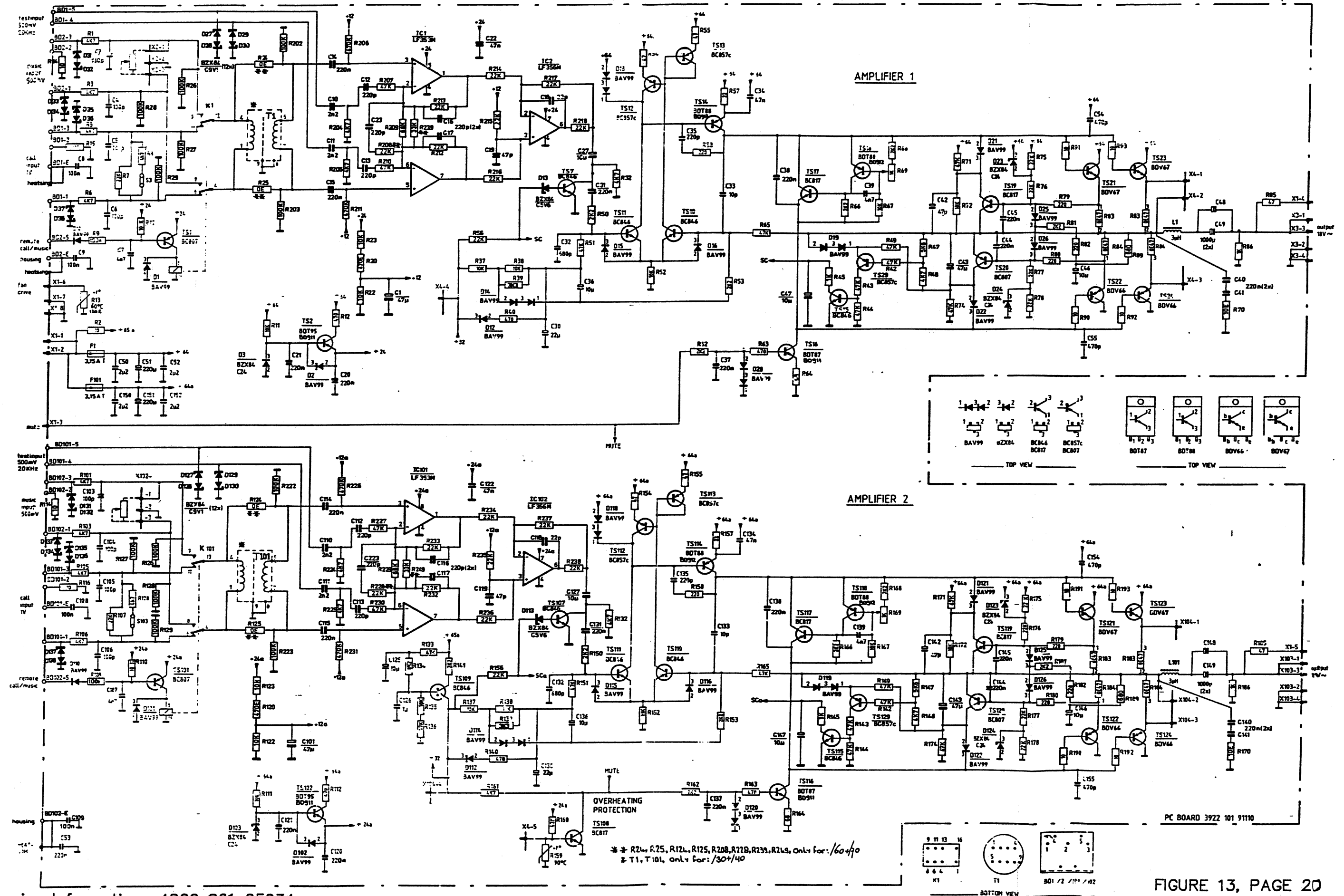


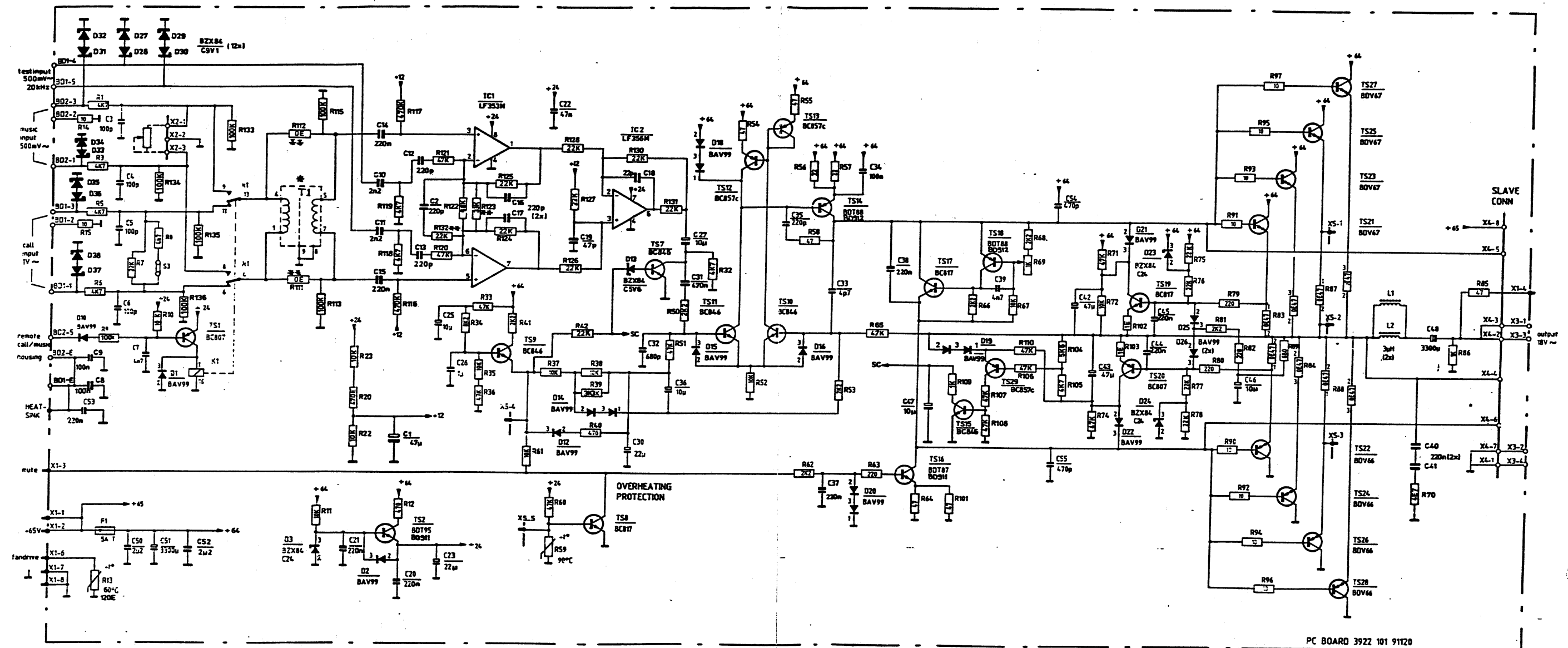
FIGURE 12, PAGE 19
 Version C, D
 CIRCUIT DIAGRAM 1 X 100W MODULE

Service Information: 4822 861 05034



Service Information: 4822 861 05034

FIGURE 13, PAGE 20
Version C, D
CIRCUIT DIAGRAM 2 X 100W MODULE



* R111, R112, R123, R132, Only for: /60+/70
 * T1, only for: /30+/40

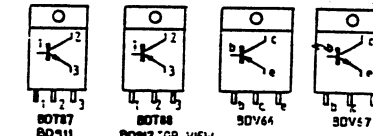
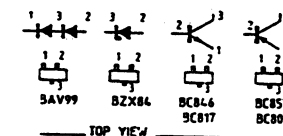
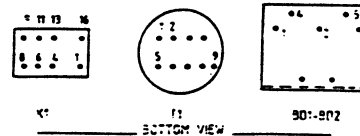
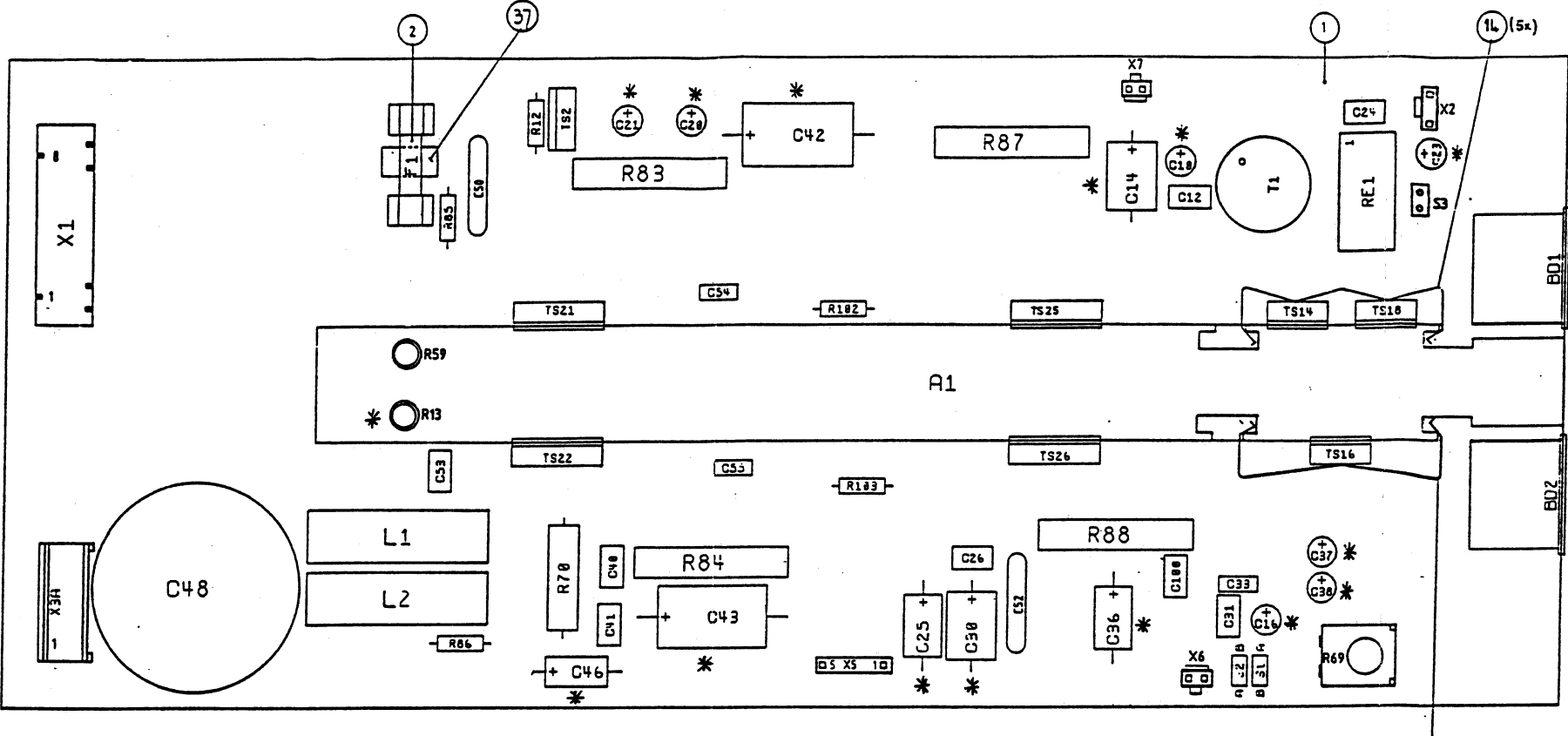
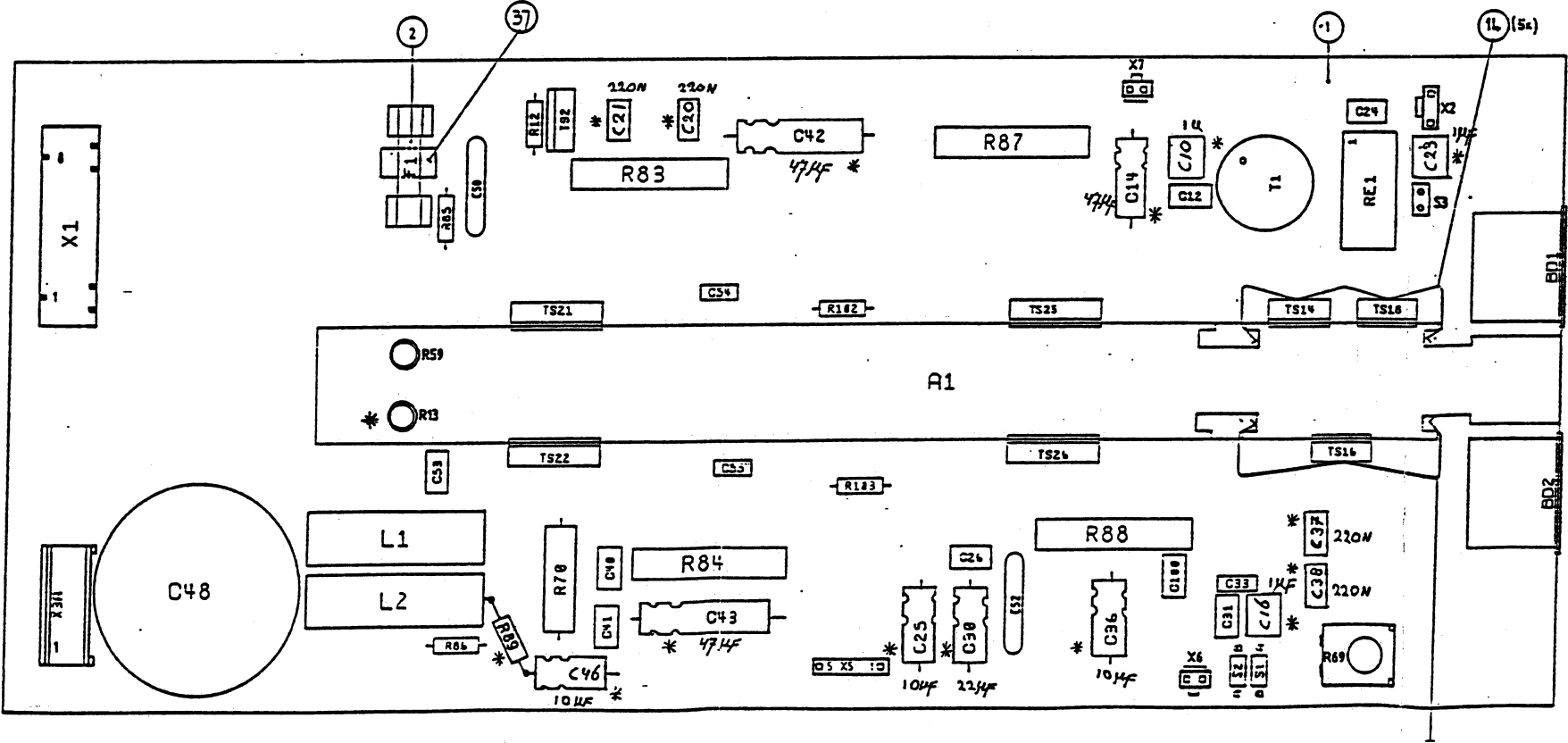


FIGURE 14, PAGE 21
 Version C, D
 CIRCUIT DIAGRAM 1 X 200W MODULE

Service Information: 4822 861 05034



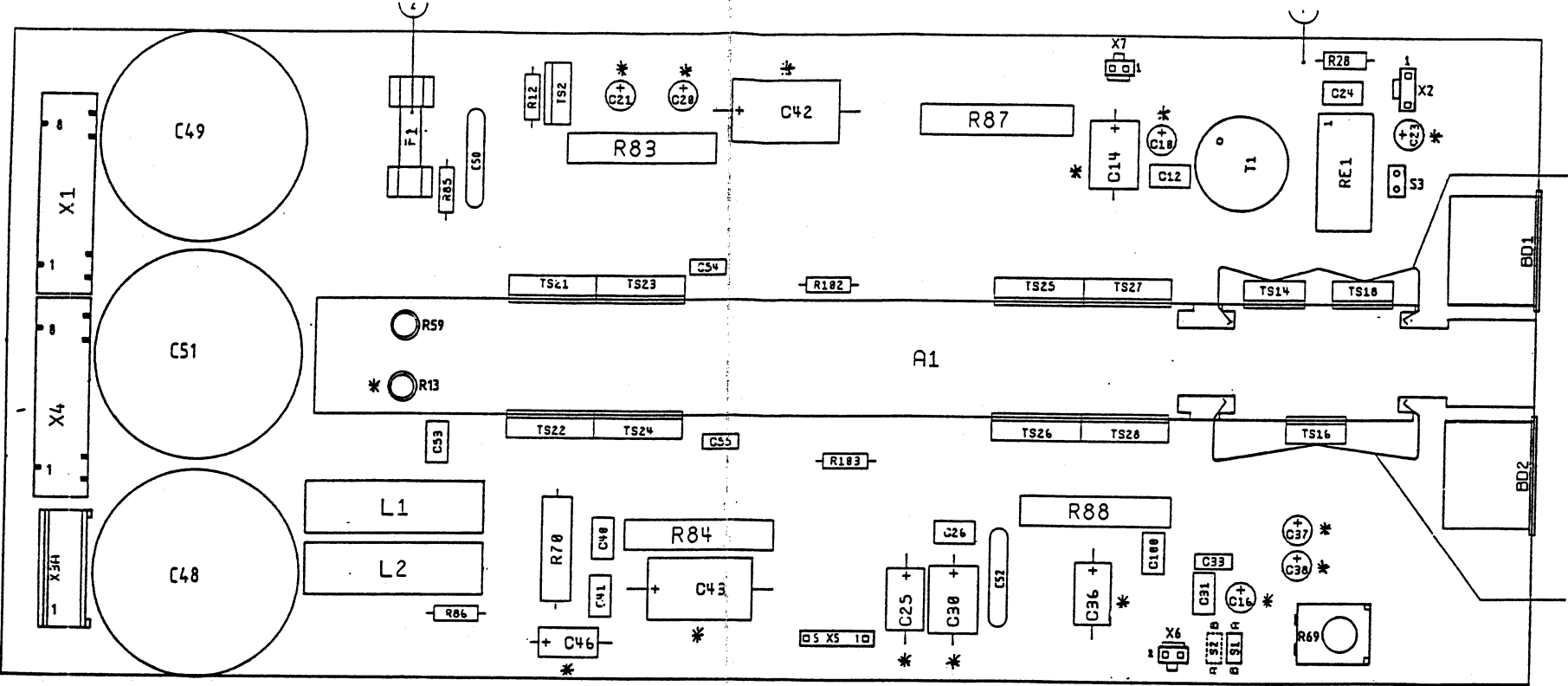
* Delete component



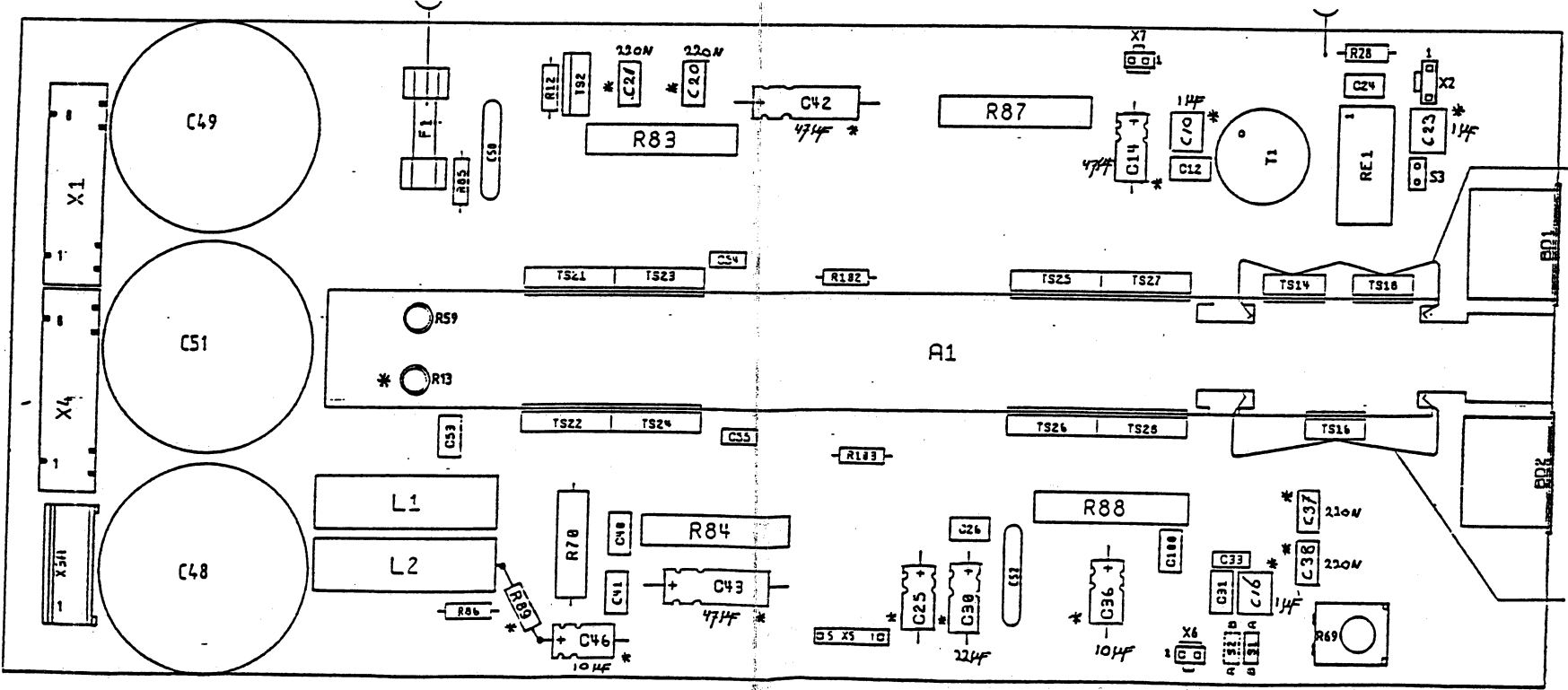
* New component

Service Information: 4822 861 05045

FIGURE 1, PAGE 9
Version A
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 1x 100W MODULE



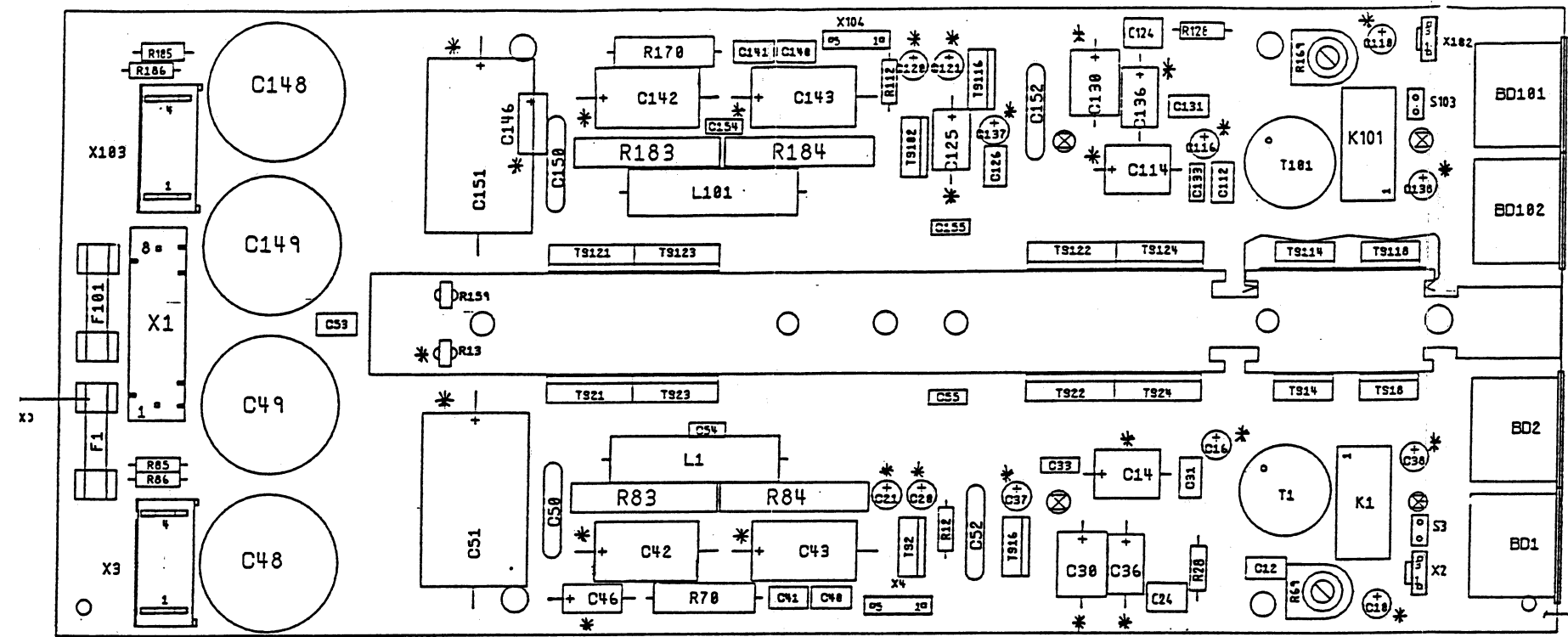
* Delete component



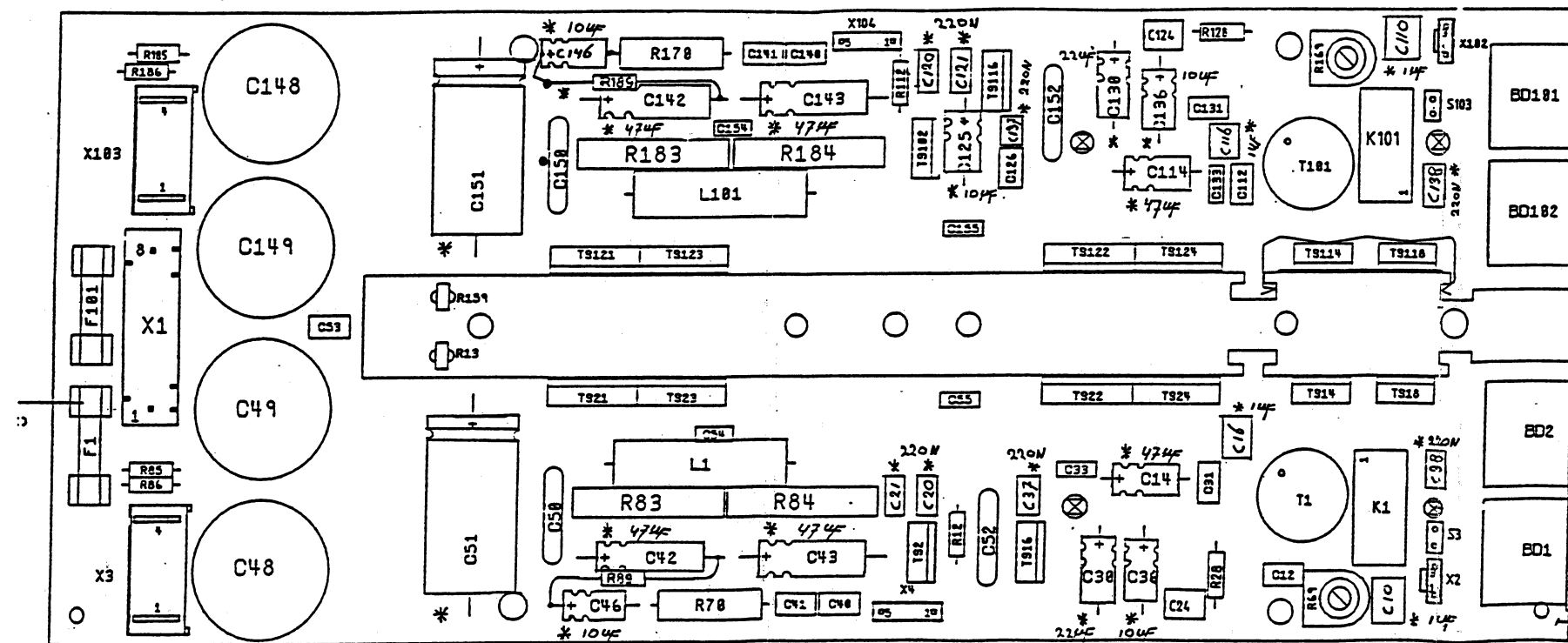
* New component

FIGURE 2, PAGE 10
Version A
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 1x 200W MODULE

Service Information: 4822 861 05045



* Delete component

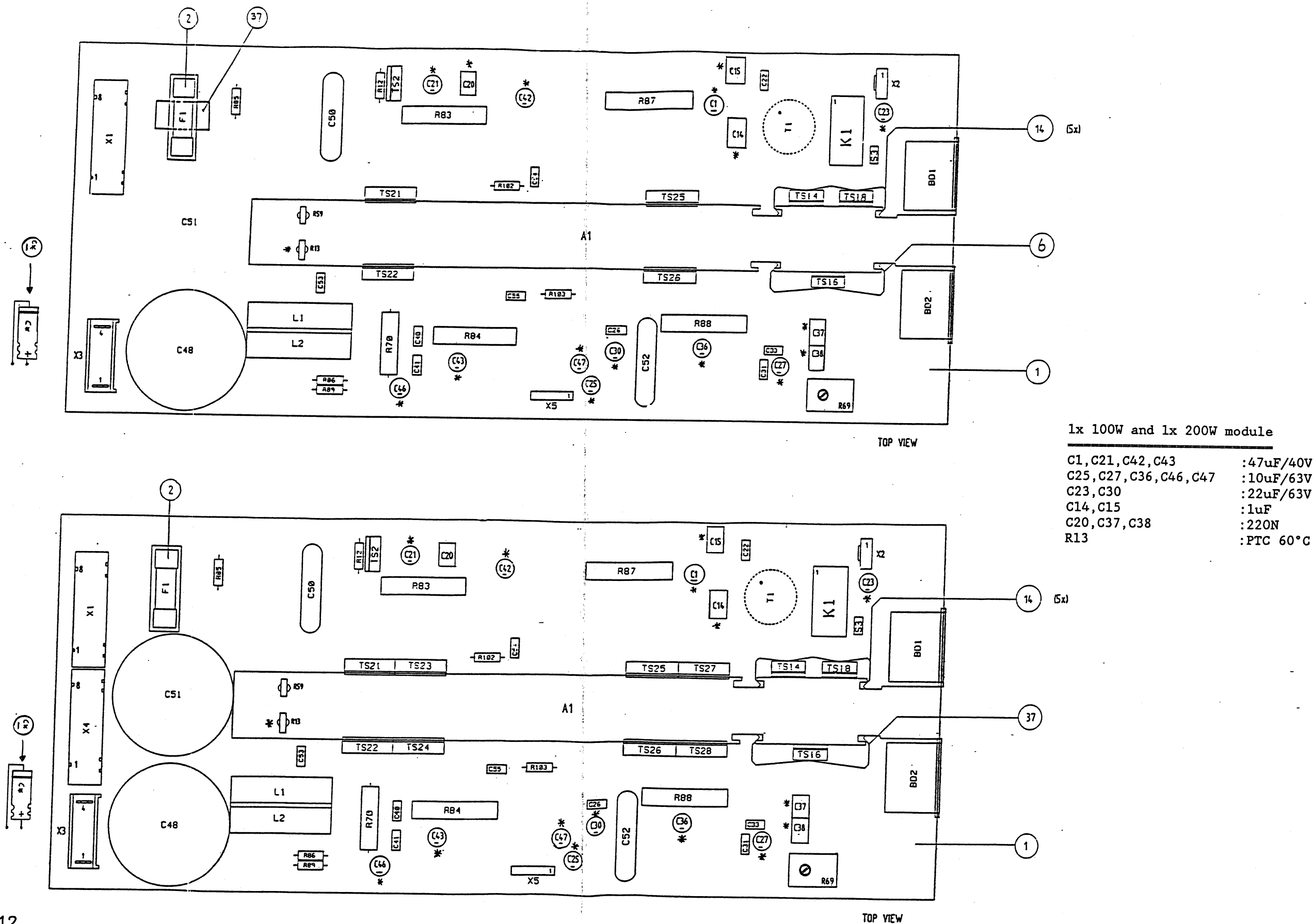


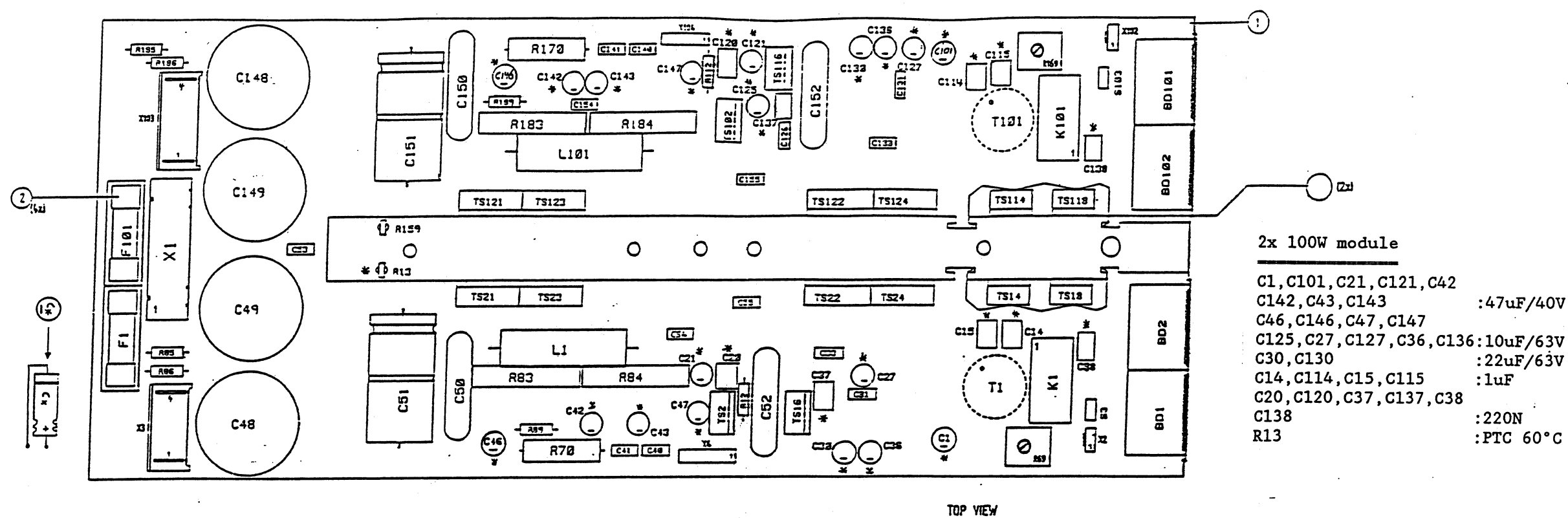
* New component

Service Information: 4822 861 05045

FIGURE 3, PAGE 11
Version A

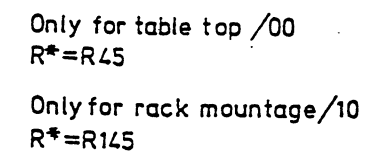
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 2x 100W MODULE





Service Information: 4822 861 05045

FIGURE 5, PAGE 13
Version B
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 2x 100W MODULE



Service Information: 4822 861 05045